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ABSTRACT

One of 15 core modules in a 22-module series designed to train vocational education curriculum specialists (VECS), this guide is intended for use by both instructor and student in a variety of education environments, including independent study, team teaching, seminars, and workshops, as well as in more conventional classrooom settings. The guide has five major sections. Part I, Organization and Administration, contains an overview and rationale, educational goals and performance objectives, recommended learning materials, and suggested reference materials. Part II, Content and Study Activities, contains the content outline arranged by goals. Study activities for each goal and its corresponding objectives follow each section of the content outline. The content focus is on selecting instructional strategies (teaching methods and media devices) for accomplishing instructional objectives, and organizing instruction. Part III, Group and Classroom Activities, suggests classroom or group activities and discussions keyed to specific content in the outline and to specific materials in the list of references. Part IV, Student Self-Check, contains questions directly related to the goals and objectives of the module, which may be used as a pretest or posttest. Part V, Appendix, contains suggested responses to the study activities from part II and responses to the student self-checks. (HD)

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VOCATIONAL EDUCATION CURRICULUM SPECIALIST

VECS

Module 8:

Development of Instructional Materials

STUDY GUIDE

(TEACHING/LEARNING MODULE)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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-Study Guide-

Module 8

DEVELOPMENT OF INSTRUCTIONAL MATERIALS

This document is one of a series of teaching/learning modules designed to train Vocational Education Curriculum Specialists. The titles of all individually available documents in this series appear below:

INTRODUCTORY MODULES

1. The Scope of Vocational Education
2. Roles of Vocational Educators in Curriculum Management
3. Current Trends in Vocational Education
4. Organization of Vocational Education
5. Legislative Mandates for Vocational Education
6. The Preparation of Vocational Educators

CORE MODULES

1. Important Differences Among Learners
2. Learning Processes and Outcomes
3. Applying Knowledge of Learning Processes and Outcomes to Instruction
4. Assessing Manpower Needs and Supply in Vocational Education
5. Laying the Groundwork for Vocational Education Curriculum Design
6. Selecting Instructional Strategies for Vocational Education
7. Derivation and Specification of Instructional Objectives
8. Development of Instructional Materials
9. Testing Instructional Objectives
10. Fiscal Management of Vocational Education Programs
11. Introducing and Maintaining Innovation
12. Managing Vocational Education Programs
13. Basic Concepts in Educational Evaluation
14. General Methods and Techniques of Educational Evaluation
15. Procedures for Conducting Evaluations of Vocational Education

SEMINARS AND FIELD EXPERIENCE MODULE

(Seminars in Authority Roles and the Curriculum Specialist in Vocational Education, and Leadership Styles and Functions of the Curriculum Specialist in Vocational Education; field work in Project Design and Administration, Operation of School Programs, Evaluation of School Programs, Educational Research and Development, and State, Regional, and Federal Program Supervision)

INSTALLATION GUIDE

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PREFACE

Who is a vocational education curriculum specialist? The answer to this question is not as simple as it might appear. A vocational education curriculum specialist is likely to work in many different capacities, including, but not limited to: instructor, department chairperson, dean of vocational-technical education, vocational supervisor, principal, state or local director of vocational education, and curriculum coordinator.

The specialist is, perhaps, more identifiable by his/her responsibilities, which include, but are not limited to:

- planning, organizing, actualizing, and controlling the work of an educational team performed to determine and achieve objectives.
- planning, organizing, and evaluating content and learning processes into sequential activities that facilitate the achievement of objectives.
- diagnosing present and projected training needs of business, industry, educational institutions, and the learner.
- knowing, comparing, and analyzing different theories of curriculum development, management, and evaluation and adapting them for use in vocational-technical education.

This teaching/learning module is part of a set of materials representing a comprehensive curriculum development project dealing with the training of vocational education curriculum specialists. The purpose of this two-year project was 1) to design, develop, and evaluate an advanced-level training program, with necessary instructional materials based on identified vocational education curriculum specialist competencies, and 2) to create an installation guide to assist instructors and administrators in the implementation process.

The curriculum presented here is, above all else, designed for flexible installation. These materials are not meant to be used only in the manner of an ordinary textbook. The materials can be used effectively by both instructor and student in a variety of educational environments, including independent study, team teaching, seminars, and workshops, as well as in more conventional classroom settings.

Dr. James A. Dunn
Principal Investigator and
presently Director,
Developmental Systems Group
American Institutes for Research

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The Vocational Education Curriculum Specialist Project was a comprehensive development and evaluation effort involving the contribution of a large number of people: project staff, curriculum consultants, a national advisory panel, and a number of cooperating colleges and universities. This wide variety of valuable inputs makes it difficult to accurately credit ideas, techniques, suggestions, and contributions to their originators.

The members of the National Advisory Panel, listed below, were most helpful in their advice, suggestions, and criticisms.

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Ken Edwards	*International Brotherhood of Electrical Workers*
Mary Ellis	*President, American Vocational Association*
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William Stevenson	*Oklahoma State Department of Education*

The project would not have been possible without the cooperation and commitment of the field test institutions listed below.

California State University, Long Beach
California Polytechnic State University, San Luis Obispo
Consortium of California State University and Colleges
- California State University, Sacramento
- California State University, San Diego
- California State University, San Francisco
- California State University, San Jose
- California State University, Los Angeles

Iowa State University
University of California Los Angeles
University of Northern Colorado

Overall responsibility for the direction and quality of the project rested with James A. Dunn, Principal Investigator. Project management, supervision, and coordination were under the direction of John E. Bowers, Project Director.

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Part I:

Organization and Administration

PART I
ORGANIZATION AND ADMINISTRATION

Guidelines

This study guide has five major sections. Each section contains useful information, suggestions, and/or activities that assist in the achievement of the competencies of a Vocational Education Curriculum Specialist. Each major section is briefly described below.

PART I: ORGANIZATION AND ADMINISTRATION

PART I contains an Overview and Rationale, Educational Goals and Performance Objectives, Recommended Learning Materials, and Suggested Reference Materials. This section will help the user answer the following questions:

- How is the module organized?
- What is the educational purpose of the module?
- What specifically should the user learn from this module?
- What are the specific competencies emphasized in this module?
- What learning materials are necessary?
- What related reference materials would be helpful?

PART II: CONTENT AND STUDY ACTIVITIES

Part II contains the content outline arranged by goals. The outline is a synthesis of information from many sources related to the major topics (goals and objectives) of the module. Study activities for each goal and its corresponding objectives follow each section of the content outline, allowing students to complete the exercises related to Goal 1 before going on to Goal 2.

PART III: GROUP AND CLASSROOM ACTIVITIES

The "Activities-Resources" column in the content outline contains references to classroom or group activities and discussion questions related to specific content in the outline. These activities and discussion questions

are located in PART III and are for optional use of either the instructor or the student. Both the classroom activities and discussion questions are accompanied by suggested responses for use as helpful examples only--they do not represent conclusive answers to the problems and issues addressed. Also contained in the "Activities-Resources" column are the reference numbers of the resources used to develop the content outline. These reference numbers correspond to the numbers of the Suggested Reference Materials in PART I.

PART IV: STUDENT SELF-CHECK

PART IV contains questions directly related to the goals and objectives of the module. The self-check may be used as a pre-test or as a post-test, or as a periodic self-check for students in determining their own progress throughout the module.

PART V: APPENDICES

Appendix A contains responses to the Study Activities from PART II, and Appendix B contains responses to the Student Self-Check. The responses provide immediate feedback to the user and allow the module to be used more effectively for individualized study. They have been included in the last part of the module as appendices to facilitate their removal should the user wish to use them at a later time rather than concurrently with the rest of the module.

Approximately 30 hours of out-of-class study will be necessary to complete this module.

Overview and Rationale

The module deals with a major phase of instructional development for vocational education: the selection of an instructional strategy (teaching methods and media devices) and the organization of content for instruction.

First, the module looks at the process of selecting instructional strategies, that is, teaching methods and media devices, for accomplishing given objectives. Unfortunately, few guidelines are readily available to help the curriculum specialist match methods and media with specific instructional objectives. This module, however, provides the specialist with an opportunity to move from the position of making selections based on folklore, habit, or "what seems to be nice" to a more cost-effective and standardized process.

Next, because organization greatly influences the efficiency of instruction and the degree to which students learn, the module examines the problem of organization of instructional content.

The purpose of this module is to provide the future curriculum specialist with some techniques and processes for developing instructional materials. In a real-world situation, the specialist will probably assist others, in a variety of subject areas, who are attempting to develop instruction. While the subject expert alone is able to supply the specific content for that instruction, the techniques and processes used are the main concern of the curriculum specialist.

The development of instruction for vocational education occurs at four levels: the curriculum level, the program level, the course level, and the unit level. A curriculum is the sum total of the learning experiences for which the school has responsibility. A curriculum may be subdivided into instructional programs, which in turn may be subdivided into courses, and then into instructional units. An instructional unit is the smallest amount of instruction that has purpose, interest, unity, and meaning within itself. It is the level of instruction with which this module is concerned. Many of the processes in the development of instructional materials at a unit level can be readily applied at a broader level of development.

This module, describing the process of developing instruction to accomplish specific objectives, is the second in a series of three

modules on the development of instruction for vocational education. The previous module, Module 7, discussed procedures both for identifying possible objectives for instruction and for writing such objectives. The last module in the series, Module 9, discusses means of assessing student achievement of the objectives of instruction.

A variety of approaches to instructional development are in practice in vocational education today. These approaches include: the integrated approach; the occupational or job analysis approach; the clusters, families, or common elements of occupations approach; the functions of industry approach; and the concept approach. (Each of these approaches is briefly described in Introductory Module 2: Roles of Vocational Educators in Curriculum Management.) This series of modules on instructional development for vocational education follows an occupational or job analysis approach because it is the most common and is often used in combination with other curriculum techniques.

Goals and Objectives

Upon completion of this module, the student will be able to achieve the following goals and objectives:

GOAL 8.1: SELECT INSTRUCTIONAL STRATEGIES (TEACHING METHODS AND MEDIA DEVICES) FOR ACCOMPLISHING INSTRUCTIONAL OBJECTIVES.

- Objective 8.11 Describe five general principles for the selection of learning experiences.
- Objective 8.12 Given a specific occupational task, identify the type of performance primarily associated with each step of the task.
- Objective 8.13 Identify teaching methods that are appropriate for each of the three domains of learning: cognitive, affective, and psychomotor.
- Objective 8.14 Given specific instructional objectives, select an instructional strategy for accomplishing each.
- Objective 8.15 Judge the quality of commercial instructional materials.

GOAL 8.2: ORGANIZE INSTRUCTION.

- Objective 8.21 Identify basic criteria and common principles of organizing instruction.
- Objective 8.22 Recognize ways of sequencing instruction.
- Objective 8.23 Develop a lesson plan for a unit of instruction.

Recommended Materials

1. Tyler, Ralph W. Basic Principles of Curriculum and Instruction. Chicago: The University of Chicago Press, 1949.

2. Mager, Robert F., and Beach, Kenneth M., Jr. Developing Vocational Instruction. Belmont, California: Fearon Publishers, 1967.

3. Completed Study Guide for Module 7: Derivation and Specification of Instructional Objectives.

Suggested References

1. American Vocational Association. Adult Distributive Education. Washington, D.C.: AVA, 1972.

2. Boucher, Brian G.; Gottlieb, Merrill J.; and Morganlander, Martin L. Handbook and Catalog for Instructional Media Selection. Englewood Cliffs, New Jersey: Educational Technology Publications, 1973.

3. Briggs, Leslie J. Handbook of Procedures for the Design of Instruction. Pittsburgh, Pennsylvania: American Institutes for Research, 1970.

4. Briggs, Leslie J.; Campeau, Peggie L.; Gagné, Robert M.; and May, Mark A. Instructional Media: A Procedure for the Design of Multi-Media Instruction, A Critical Review of Research, and Suggestions for Future Research. Pittsburgh, Pennsylvania: American Institutes for Research, 1967.

5. Burns, Richard W., and Brooks, Bary D., eds. Curriculum Design in a Changing Society. Englewood Cliffs, New Jersey: Educational Technology Publications, 1972.

6. Butler, F. Coit. Instructional Systems Development for Vocational and Technical Training. Englewood Cliffs, New Jersey: Educational Technology Publications, 1972.

7. Byers, Edward E., and Huffman, Harry H. Writing Performance Goals: Strategy and Prototypes. New York: Gregg Division, McGraw-Hill Book Company, 1971.

8. Drawbaugh, Charles C., and Hull, William L. Agricultural Education: Approaches to Learning and Teaching. Columbus, Ohio: Charles E. Merrill Publishing Company, 1971.

9. Fleck, Henrietta. Toward Better Teaching of Home Economics. New York: The Macmillan Company, 1968.

10. Gerlach, Vernon S., and Ely, Donald P. Teaching and Media: A Systematic Approach. Englewood Cliffs, New Jersey: Prentice-Hall, 1971.

11. Giachino, J. W., and Gallington, Ralph O. Course Construction in Industrial Arts, Vocational and Technical Education. 3rd ed. Chicago: American Technical Society, 1967.

12. Goldstein, Irwin L. Training: Program Development and Evaluation. Monterey, California: Brooks/Cole Publishing Company, 1974.

13. Goodlad, J. "Directions of Curriculum Change." In Contemporary Thought on Public School Curriculum, edited by E. Short and G. Marconnit. Dubuque, Iowa: William C. Brown Company, 1968.

14. Kemp, Jerrold E. Planning and Producing Audiovisual Materials. 2nd ed. Scranton, Pennsylvania: Chandler Publishing Company, 1968.

15. Larson, Milton E., and Valentine, Ivan E. Vocational Education Curriculum Development Handbook. Fort Collins, Colorado: Department of Vocational Education, Colorado State University, January 1974.

16. McMahon, Gordon G. Curriculum Development in Trade and Industrial and Technical Education. Columbus, Ohio: Charles E. Merrill Publishing Company, 1972.

17. Mager, Robert F., and Beach, Kenneth M., Jr. Developing Vocational Instruction. Belmont, California: Fearon Publishers, 1967.

18. Miller, W. R., and Rose, Homer C. Instructors and Their Jobs. 3rd ed. Chicago: American Technical Society, 1975.

19. Navy Instructional Media Requirements Analysis System. San Rafael, California: General Programmed Teaching, 1973.

20. Pautler, Albert J. Teaching Shop and Laboratory Subjects. Columbus, Ohio: Charles E. Merrill Publishing Company, 1971.

21. Pucel, David J., and Knaak, William C. Individualizing Vocational and Technical Instruction. Columbus, Ohio: Charles E. Merrill Publishing Company, 1975.

22. Richmond, W. Kenneth. The School Curriculum. London: Methuen & Co. Ltd., 1971.

23. Silvius, G. Harold, and Bohn, Ralph. Planning and Organizing Instruction. Bloomington, Illinois: McKnight Publishing Company, 1976.

24. Smith, Robert G., Jr. Innovations in Teaching and Training. Detroit: American Data Processing Inc., 1968.

25. Taba, Hilda. Curriculum Development: Theory and Practice. New York: Harcourt, Brace and World, 1962.

26. Tyler, Ralph W. Basic Principles of Curriculum and Instruction. Chicago: The University of Chicago Press, 1949.

Part II:

Content and Study Activities

PART II
CONTENT AND STUDY ACTIVITIES

Content Outline	Activities-Resources

Introductory Remarks: Instructional Development for Vocational Education

A. Instructional development for an occupation has as its goal the preparation of the learner to obtain, perform, and advance in a job; all activities should be accomplished with this goal in mind.

B. Instructional development for an occupation is a difficult task, since technology continually changes the jobs that are in existence and also brings about new ones. This requires the curriculum specialist to continually review, update, and improve the curriculum.

C. Once a task analysis has been translated into instructional objectives (Module 7), the next step is to design an instructional system for accomplishing these objectives--that's the subject of this module. The instructional system includes a strategy for developing in learners the skills, knowledge, and attitudes that are required to perform the job. When the instructional strategy has been translated into learning activities, instructional materials must be developed to implement these activities.

D. Types of instructional materials may include:

1. teacher and student materials;
2. materials for group instruction;
3. materials for individualized instruction.

E. The development of sound instructional materials should include consideration of the following factors:

1. Does it have a reasonable basis in authority?
2. Is it technically accurate?
3. Is it sufficiently adequate in scope to cover the instructional unit?
4. Is it written at the educational level of the student?
5. Is it divisible into simple instructional units?
6. Is it organized for individual use?
7. Does it provide for individual student response and evaluation?
8. Does it provide an easy procedure with which the teacher can check student achievement?
9. Is it psychologically sound?
10. Is it attractive in appearance? (15)*

F. The following emerging trends should be used in establishing plans and priorities for future curriculum development:

1. There is a trend in curriculum development away from material constructed by a single school to massive, funded projects.

(15) Vocational Education Curriculum Development Handbook.

* See Discussion Question A in Part III.

2. Persons with varied talents are being used to develop curriculum (analysts, psychologists, writers and editors, objective writers, media and learning specialists).
3. There are now team efforts as opposed to individual efforts.
4. Curriculum is no longer designed around a single textbook (15).*

(15) Vocational Education Curriculum Development Handbook. See also: (5) Curriculum Design in a Changing Society; (13) "Directions of Curriculum Change"; and (22) The School Curriculum.

* See Discussion Question B in Part III.

Goal 8.1

Content Outline	Activities-Resources

Goal 8.1: Select Instructional Strategies (Teaching Methods and Media Devices) for Accomplishing Instructional Objectives.

A. Instructional Strategies and Learning Experiences

1. The main function of instructional strategies should be to help the learner achieve and demonstrate proficiency in the instructional objectives. (A common trap for the vocational curriculum specialist is his becoming so absorbed in possible instructional activities that he loses sight of the instructional objectives, which should remain the basis of all instructional strategy.)*

2. It is important that a system of instructional strategies be defined, whether the curriculum specialist is preparing materials for a single class or for an entire institution. The system is defined as an integrated combination of personnel, media devices, equipment, and teaching methods which, if experienced by a learner, will enable that learner to demonstrate proficiency in the instructional objectives (21).

* See Discussion Question C in Part III.

(21) Individualizing Vocational and Technical Instruction, Chap. 5.

3. Once the instructional objectives have been specified, the curriculum specialist can examine the teaching methods and media devices available and choose those most appropriate for the given objectives. This procedure should be appropriate for the three different types of objectives: cognitive, psychomotor, and affective. At a very general level, there is basic knowledge that helps specify the appropriate strategy for particular types of objectives. For example, simulation activities in vocational education are used for the development of content knowledge, while role-playing is designed to acquaint students with a variety of interpersonal situations. Unfortunately, however, there has been no advancement beyond such broad generalities. This is due to:
   a. difficulties encountered in the development of a comprehensive set of categories to describe the type of learning underlying the instructional objectives;
   b. the dilemma of determining the behaviors that are likely to be modified by the various strategies (12).
4. According to Goldstein, the difficulties and dilemmas just described exist for several reasons:
   a. the empirical research necessary to establish the relationships between kinds of learning experiences and particular outcomes has been insufficient;

(12) Training: Program Development and Evaluation, Chap. 8.

b. most research efforts have emphasized reactions and learning in the training setting rather than performance in the real-world setting;

c. empirical studies that have been done have generally been based on demonstrations of the value of the strategy rather than on the nature of the learning activities for which the strategy was devised (12).

(12) Training: Program Development and Evaluation, Chap. 8.

B. Instructional Strategies and Instructional Objectives

1. Unfortunately, there are no "correct" instructional methods or devices for a given instructional objective, and the search for one is bound to be fruitless. In virtually every case, however, there is a range of instructional methods and devices appropriate to the task or behavior to be taught. The various features of these methods or devices become advantages or disadvantages only in a given instructional context, depending on such factors as instructor's intent and experience, student characteristics, individualization of instruction, job performance priorities, and administrative constraints. Any selection procedure, then, must necessarily, even if unconsciously, make compromises, tradeoffs, and even arbitrary decisions in order to choose one method or device over another (19).

(19) Navy Instructional Media Requirements Analysis System.

2. The critical element in instruction, though, is not the particular instructional method or device that is used, but the organization of the information into audio, visual, and other types of stimuli for presentation to the student. These stimuli should be chosen largely for their appropriateness to the instructional content and the on-the-job conditions. Methods and devices can then be selected, from the range of those capable of transmitting the relevant stimuli, on the basis of relevant administrative criteria (19).*

(19) Navy Instructional Media Requirements Analysis System.

* See Discussion Question D in Part III.

3. Various authors have specified their own general criteria for the selection of instructional strategies.* What follows are some of these criteria.

* See Classroom Activity 1 in Part III.

4. Butler establishes some general guidelines in the selection of media:
   a. The instructional objectives themselves are the primary determinants of the best media to use.
   b. Matching the media to the various kinds of learning involved in a lesson is more effective than trying to satisfy the so-called individual learning styles of students.
   c. There is usually no best medium, or mix of media, for a unit of instruction, because each learning event leading to the attainment of the objective may require a different mix of media.

d. According to Butler, the best procedure usually is to select the least elaborate and least costly medium that will apparently enable the learner to acquire the desired capability.

e. All things being equal, well-illustrated, step-by-step verbal instructions with feedback to the student is the most practical, effective, and efficient medium for most types of learning.*

f. In some instances, cost factors may dictate media selections concerned primarily with the most advantageous mix of self-paced individualized instruction and group-paced lecture demonstrations (6)*

* See Discussion Question E in Part III.

(6) Instructional Systems Development for Vocational and Technical Training.

5. Gerlach and Ely specify two criteria for the selection of instructional approaches: efficiency and effectiveness. "Efficiency and effectiveness should be considered together. If an objective is accomplished in less time with one method than another, it is more efficient. If the retention or transfer of the information or skill learned is greater for one method than another, then it is more effective for reaching that objective. In any case, when determining the approach to be followed, the best estimate of both efficiency and effectiveness will have to be followed. If the approach is studied carefully, future predictions will be based on empirical data of past experiences and they will probably result in better teaching" (10).

* See Discussion Question F in Part III.

(10) Teaching and Media: A Systematic Approach, Chap. 11.

6. In selecting a teaching method, Fleck recommends that the one chosen meet the following criteria:
   a. is appropriate to the maturity of the students;
   b. can be used with confidence;
   c. is suitable to the particular objectives of the lesson;
   d. can be adapted to student needs, problems, and interests;
   e. gives students an opportunity to share in goal-setting, learning experiences, and evaluation;
   f. permits flexibility in planning;
   g. provides for individual differences in learning, capacities, and background among students;
   h. implements a democratic philosophy;
   i. provides for cooperative effort or group work;
   j. gives students an opportunity to inquire, to analyze, to explore, to be active, to create, and to initiate;
   k. gives the teacher an opportunity to observe students' progress (9).*

(9) Toward Better Teaching of Home Economics, Chap. 8. See also (24) Innovations in Teaching and Training, Chap. 8.

* See Discussion Question G in Part III.

C. Commercial Instructional Materials

1. Pucel and Knaak (21) have established criteria by which commercially prepared materials should be rigorously evaluated.
2. For print materials, use the following criteria:

(21) Individualizing Vocational and Technical Instruction, Chap. 5.

a. Content: Does it closely follow the requirements of the tasks to be learned? What percentage of the total tasks can be covered with this resource? Are there serious omissions, outdated information, or over-emphasis of minor aspects?

b. Level: Is the vocabulary written at a difficulty level similar to other print materials in that field for that age? Is the style readable?

c. Format: Are there sufficient and clear illustrations? Is the binding, type, and paper appropriate for the intended usage?

d. Authorship: Is the author a recognized authority? Has the publisher developed a sound reputation through previous publications?

e. Treatment: Is there unbiased presentation of matters relating to labor, government, minorities, and controversial issues?*

3. For visual media (film and videotape), use the following criteria:

a. Content: Does it follow the requirements of the tasks to be learned? What percentage of the tasks can be covered with this resource? Are there omissions or outdated information?

b. Level: Is the material appropriate for the age level of the viewers? Is there sufficient action? Is the pacing and sequencing appropriate?

* See Classroom Activity 2 in Part III.

c. Presentation: Is the material more effective than demonstrating, reading, discussing, or experimenting?

d. Authorship: Are the producer and editor qualified?

e. Technical Quality: Are images sharp? Is the color natural? Is sound intelligible and realistic? Is continuity natural and understandable? Are there conflicts between music and speech? Are there difficulties in following image and/or sound? Are image and sound synchronized (21)?*

(21) Individualizing Vocational and Technical Instruction, Chap. 5.

* See Classroom Activity 3 in Part III.

D. Study Activities

Based on your reading of the content outline and any additional references as suggested, complete the following activities.

Instructional Strategy and Learning Experiences

In Module 7, Derivation and Specification of Instructional Objectives, you learned about the ends to be attained by an instructional unit. In this module, you will consider how these ends can be attained by the selection of an appropriate instructional strategy, that is, by the selection of teaching methods and media devices.

An instructional strategy in and of itself does not provide for learning. It is the instructional strategy plus the student with all his unique characteristics that create the learning experience. (Learning experience= teaching method + media + student.) It is through these learning experiences that learning will take place and instructional objectives will be accomplished.

Other modules in this program have considered the individual learner. This module, however, considers the instructional strategy. As you proceed through it, keep in mind that the instructional strategy cannot be isolated from the learner--that it is the strategy plus the learner that make up the learning experience.

1. Read Chapter 2: "How Can Learning Experiences Be Selected Which Are Likely To Be Useful in Attaining These Objectives?" in Tyler, Basic Principles of Curriculum and Instruction. Then complete the following questions.

   a. Tyler enumerates five general principles for selecting learning experiences. List these five principles and briefly describe each.
   b. For each of the five general principles enumerated by Tyler for selecting learning experiences, provide an illustrative example from vocational education.

Selecting Instructional Strategies

There may be several instructional strategies from which to choose when developing a unit of instruction. How does a curriculum specialist decide *when* to use a specific instructional strategy and how does he decide *what* instructional strategy to use?

According to Mager and Beach, "In the way one selects a tool from the toolbox by knowing what he needs to accomplish, one chooses an instructional strategy by first identifying the kind of *performance* he wants to develop."

Determining the type of performance desired of the student is the *first* step in selecting an instructional strategy to help him achieve a specific instructional objective. The objective itself states the specific desired performance or behavior. Given this objective, the curriculum specialist must determine what *type* of performance it requires. Chapter 8: "Types of Performance" in Mager and Beach, *Developing Vocational Instruction*, describes several different kinds of performance: discrimination, problem-solving, recall, manipulation, and speech.

2. Read Chapter 8: "Types of Performance" in Mager and Beach, *Developing Vocational Instruction*. Then answer the following multiple-choice questions by marking an "X" at the appropriate choice.

   For each of the tasks stated below, identify the type of performance primarily associated with each.

   a. Troubleshoot an inoperative IBM selectric typewriter.

      _____a. discrimination

      _____b. problem-solving

      _____c. recall

      _____d. manipulation

      _____e. speech

b. Greet a customer in an appropriate manner.

_____a. discrimination

_____b. problem-solving

_____c. recall

_____d. manipulation

_____e. speech

c. Recognize when a customer is in an angry mood.

_____a. discrimination

_____b. problem-solving

_____c. recall

_____d. manipulation

_____e. speech

d. Repair a leaky faucet.

_____a. discrimination

_____b. problem-solving

_____c. recall

_____d. manipulation

_____e. speech

e. Know the correct type of plow to use in very wet soil.

_____a. discrimination

_____b. problem-solving

_____c. recall

_____d. manipulation

_____e. speech

f. Identify the appropriate table appointments to use when setting a table for a formal five-course dinner for eight.

_____a. discrimination

_____b. problem-solving

_____c. recall

_____d. manipulation

_____e. speech

g. Determine when a piece of unfinished walnut has been sanded sufficiently.

_____a. discrimination

_____b. problem-solving

_____c. recall

_____d. manipulation

_____e. speech

h. Determine the fertilizer needs for one acre of tomatoes.

_____a. discrimination

_____b. problem-solving

_____c. recall

_____d. manipulation

_____e. speech

3. After reading Chapter 8: "Types of Performance" in Mager and Beach, complete the following activity.

In Module 7: Derivation and Specification of Instructional Objectives, you analyzed the steps involved in performing a specific occupational task. (See the Task Detailing Sheet you completed on page 27 of the Study Guide for Module 7.) Now, for each of the steps you listed for performing that task, indicate the type of performance with which it is

primarily associated. Check your work with the instructor and discuss any problems you encountered in identifying types of performance.

4. After reading Chapter 8: "Types of Performance" in Mager and Beach, answer the following questions.

   a. What is the relationship between identifying the type of performance primarily associated with an occupational task and selecting an instructional strategy?

   b. After using the performance categories described by Mager and Beach, how do you like them? Were they useful or do you have other categories that you prefer?

Teaching Methods and Learning Domains (1)

Educational psychologists define learning as a change in behavior. This change in behavior should occur in three distinct areas:

1. Cognitive (knowledge of information, facts, concepts, and the ability to apply, analyze, synthesize, and evaluate);
2. Affective (attitudes, feelings, and values);
3. Psychomotor (muscular action, skill, and dexterity).

Learning, then, in the full sense of the word, is a three-dimensional activity. It requires sublearnings in each of the above areas. Learning in any one of these areas does not guarantee learning in the other two. For example, it cannot be assumed that rote memorization of facts will result in improved skill or a change in attitude.

It is important to maintain some degree of balance among the three sub-learning areas. This is not to suggest that equal time be devoted to changing the learner's attitude and only a moderate amount of time to the psychomotor and knowledge areas. Each learning situation is unique and requires careful planning on the part of the curriculum specialist. Also, it must be recognized that certain teaching methods are more appropriate in effecting a change in one of the three sublearning areas than in the others. The following are examples of such methods:

1. Cognitive
    a. programmed instruction
    b. lecture
    c. reading assignment
    d. worksheets
    e. case problems
2. Affective
    a. roleplaying
    b. field interviews
    c. guest speakers
    d. group discussion
    e. instructor's personal example
3. Psychomotor
    a. practice and drill
    b. demonstrations
    c. on-the-job training
    d. simulated performance

It should be noted that in some situations, a combination of the above teaching methods should be used to bring about a positive change in one of the sublearning areas.

Malcolm S. Knowles has stated that active participation by the learner is the dominating concept underlying the new education methodology. To achieve a maximum involvement by class members, the instructor should use a variety of "participating" teaching methods:

1. Programmed instruction--This method of instruction is especially effective when it is necessary to present introductory material of a routine nature. These materials are well suited for a group of learners with diverse abilities; they individualize instruction so each person can progress at his own rate. Frequently, the sponsoring agency will need to schedule a limited number of group meetings to provide orientation and develop unity of purpose.

2. The penetrating question--This is the oldest, yet one of the most effective ways of promoting individual and group involvement. Effective questions seldom develop spontaneously; they need to be carefully planned prior to class time and logically integrated into the instructor's presentation.

3. Roleplaying--Roleplaying is especially well suited to exploring situations in which the reactions and feelings of individuals are involved. This instructional method will be effective only when it is used thoughtfully and appropriately. The instructor should be familiar with all of the steps that must be taken to create a successful role-playing situation.

4. Group discussion--One of the principal methods of getting class participation is involvement by discussion. Effective group discussion is the result of advanced planning and regard for proven discussion techniques.

5. Small group discussion--By dividing the class into small groups, it is possible to realize nearly 100 percent participation by class members; this is a worthwhile goal in education because each person should have the opportunity to express his views and engage in meaningful dialogue with fellow class members.

6. Dyad--This is a variation of the small group discussion method. Class members are divided into groups of two persons each. One learner may assume the role of teacher, the other that of student, in a skill-building situation. One person may take the "pro" and the other the "con" during the discussion of a problem or issue.

7. Triad--A triad is used in the same manner as the dyad except the class participants are divided into groups of three.

8. Case problems--Case problems can be very effective because they present concrete situations, either actual or hypothetical, with which the group can identify.

9. Brainstorming--Participants are encouraged to list for a period of time (five to ten minutes) all the ideas that come to their minds regarding some problem or topic of interest. Each class member is encouraged to offer as many ideas as possible, without regard to the

practicality of their suggestions. Critical appraisal of these suggestions comes during the post-brainstorming session.

10. Field interview--The learner is asked to interview (outside the classroom) a person or a group of persons who can supply information relative to a problem or issue. This type of out-of-class assignment can be used to supplement classroom instruction.

5. Having read the preceding material on "Teaching Methods and Learning Domains," complete the following multiple-choice questions by marking an "X" at the appropriate choice.

   a. If you wanted students to obtain basic knowledge about the primary functions of the human body, what would be the most appropriate teaching method?

      _____a. group discussion

      _____b. programmed instruction

      _____c. demonstration

      _____d. roleplaying

   b. If you wanted students to develop positive safety attitudes in the shop, what would be the most appropriate teaching method?

      _____a. programmed instruction

      _____b. case problems

      _____c. roleplaying

      _____d. lecture

c. If you wanted students to learn how to operate an electric proportional spacing typewriter, what would be the most appropriate teaching method?

_____a. practice and drill

_____b. group discussion

_____c. simulated performance

_____d. reading assignment

d. If you wanted students to learn the parts of an automobile engine, what would be the most appropriate teaching method?

_____a. on-the-job training

_____b. case problems

_____c. guest speakers

_____d. programmed instruction

6. Read Chapter 9: "Selection of Instructional Procedures" in Mager and Beach, Developing Vocational Instruction. Then complete the following activity.

In Module 7, Derivation and Specification of Instructional Objectives, you wrote instructional objectives for specific occupational tasks. (See the Objectives Specification Sheet you completed on page 53 of the Study Guide for Module 7.) Now select a task for which you specified objectives in all three domains: cognitive, affective, and psychomotor. Next, select instructional strategies (teaching methods and media devices) appropriate for accomplishing each of these objectives. Use Mager and Beach's three guides for strategy selection. Then from the appropriate instructional strategies you selected, identify the most practical one--that is, the one most likely to be available and the one most likely to be within the school budget. Use a form like the one on the next page to write the objective and the corresponding instructional strategies. (You will need to prepare a form for each objective. Adequate space is not provided in this guide, so use additional sheets of paper as necessary.)

SELECTION OF INSTRUCTIONAL STRATEGIES

Objective:

Domain:

Appropriate instructional strategies:

Most practical instructional strategy:

7. Look at the instructional strategies you selected as most practical in the last exercise. Now ask yourself the following questions about each strategy.

   a. Does the strategy give the student an opportunity to practice the kind of behavior implied by the objective and does the strategy sample the kind of content implied by the objective?

   b. Is the strategy likely to be satisfying to the particular students for which it is planned, that is, does it allow students to experience success?

   c. Does the strategy require actions that the students are not yet ready or able to perform?

   d. Does the strategy capitalize on the various interests of both students and faculty members?

   e. Does the strategy provide for the attainment of several objectives or is it concerned with only one or two?

   After asking yourself these questions, would you change your mind about any of the instructional strategies you selected? If so, explain why and select another strategy.

   If you weren't able to answer all of the questions, don't worry--it's very reasonable since you don't know the particular students for whom you are selecting an instructional strategy. And that is the whole point of instructional development; you can know all the proper techniques and processes to apply to develop instructional materials, but without knowledge of the individual students, these techniques and processes are meaningless.

8. Read the article by R. H. Anderson, "Selection of Media: Another Perspective," provided on the following pages. Then complete the activity below.

Again look at the instructional strategies you selected in Activity 6. as the most practical ones for accomplishing specific objectives. Now use the flow chart technique offered by Anderson to select an instructional strategy for each of these same objectives. Note this strategy too on the forms you completed for Activity 6. Then answer these questions.

a. How did the instructional strategies you selected by the flow chart technique compare with those you had previously selected? Were they the same? If not, how would you explain the difference?

b. How useful was the flow chart technique in selecting an instructional strategy? Did it make the selection process easier or more difficult? Would you recommend the flow chart technique to others?

c. Perhaps you know of a technique for selecting an instructional strategy that is more useful than those mentioned in this module. If so, briefly describe that technique here and be prepared to present it in class.

SELECTION OF MEDIA: ANOTHER PERSPECTIVE[1]

R. H. ANDERSON[2]
Illinois Bell Telephone Company

A reference guide was designed to assist course developers in the selection, development and testing of instructional "software" materials. The guide is divided into a series of relatively self-contained sections to allow course developers the flexibility to use these materials in several ways. The guide is an attempt to impose some logical structure on the media selection process. A set of flow charts are proposed which serve as decision tables.

During the training strategies phase of course development, the training writer must determine the instructional media best suited to the course objectives, content, and format. This is often a difficult decision to make because it is based on a combination of complex and inter-related factors. To select the appropriate media, the developer must evaluate and resolve such issues as:

1. What degree of stimulus and/or response simulation is necessary and available?
2. What medium (or media) is most practical for packaging, implementation, and updating?
3. What hardware is readily available to implement the course?
4. What cost-effective alternatives are available in the production and maintenance of the software involved?
5. How "locked-in" should the training be?
6. Does the course value (amount of behavior change, target population, or life of course) justify the media cost?

The final selection of instructional media reflects the developer's ability to evaluate and balance priorities among these various issues. It is, in essence, a statement of the developer's values concerning these variables and represents the communication vehicle best able to

[1] The author owes a debt of gratitude to several nice people for lending their assistance and encouragement during the development of this guide. They are: Dick Lewis, Rudy Bretz, Jerry Kemp and Pat Lynch.

[2] Requests for reprints should be sent to the author, Illinois Bell Telephone Co., 225 W. Randolph St., 15F, Chicago, Ill., 60606.

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effectively and efficiently achieve the course objectives.

Unfortunately, there are few guidelines readily available to help the writer make these decisions. No fool-proof, cross-reference tables for selection of instructional media for specific objectives exist. Validated historical data on behavior change using specific media are generally contradictory and imprecise. Cost figures of various software alternatives are difficult to determine and sometimes vague. Literature extolling the virtues of various types of hardware is available, but often misleading. In addition, technological advances in recent years have made the cost of hardware obsolescence phenomenal.

The following excerpt from the report by the Commission on Instructional Technology of the House of Representatives Committee on Education and Labor states the problem briefly as follows:

> In order to reflect present-day reality, the Commission has had to look at the pieces that make up instructional technology: television, films, overhead projectors, computers, and the other items of 'hardware' and 'software' (to use the convenient jargon that distinguishes machines from programs). In nearly every case, these media have entered education independently, and still operate more in isolation than in combination. . . . Instructional technology goes beyond any particular medium or device. . . . It is a systematic way of designing, carrying out, and evaluating the total process of learning, teaching and communication, and employing a combination of human and nonhuman resources to bring about more effective instruction. (1970, p. 19.)

In an earlier report submitted to the United States Office of Education by the American Institute for Research, the field of instructional media as viewed then was described as follows:

> A situation (exists) in which there is no generally understood rationale as to why some information is presented by film rather than by programmed instruction, or by books rather than by slides and sound track. . . . Instructional objectives are presented by all kinds of media, without much rhyme or reason other than that the film maker works in his medium and the bookwriter works in his. . . When multiple media are used in a course of instruction, the rationale of the particular combination of media employed is no more systematic or logical than the rationale by which the component items came to be

> produced. There is competition among media producers for their media to have a prominent place in the total array of items to be used in the absence of a theory upon which justification could exist for teaching each type of educational objective by a medium having special relevance for the kind of learning conditions required. . . Media research has not even focused upon how to choose from among existing media. Much research has been devoted to techniques for improving films, for example, but there is a neglect of research which shows circumstances requiring that a film be made and used for instruction. (1966, p.2.)

Since these studies were completed, some small inroads have been made into the process of matching instructional objectives with media. Perhaps some of the advancement has been offset by the increased availability of more (and varied) hardware, but some basic decisions facing course writers are more clearly understood.

When preparing a reference guide such as this, a temptation exists to somehow label the content as "the last word" on the subject. It would be nice if it were true. However, when faced with the amount of learning research currently underway and the competition among hardware manufacturers to provide novel features and cost effectiveness, it is likely that this material will have to be continually updated. This is, however, a starting point. We have an opportunity to move from the position of making selections based on folklore, habit, or "what seems to be nice" to a more cost-effective and standardized process.

SELECTION GUIDELINES

The problem of selecting an effective and efficient medium to communicate lesson content is sometimes eliminated by the phrasing of the training request. "Lets have a nice slide-tape lesson on". . or "We need a video-tape course on". . . are statements that replace one problem with another. Implied in this type of request is that the subject matter and target population have been researched, and this is the most effective medium available for displaying relevant stimuli and providing feedback. It is also presumed that this is prob*ably* the most efficient transmission vehicle for developing, distributing and updating lesson materials. Unfortunately, in some cases these factors have *not* been considered and this predetermined medium may impose severe limitations on the course writers' efforts.

What is presented in this section is an attempt to impose some logical structure on the media selection process. This proposal is based on the notion that we exercise this process, with varying

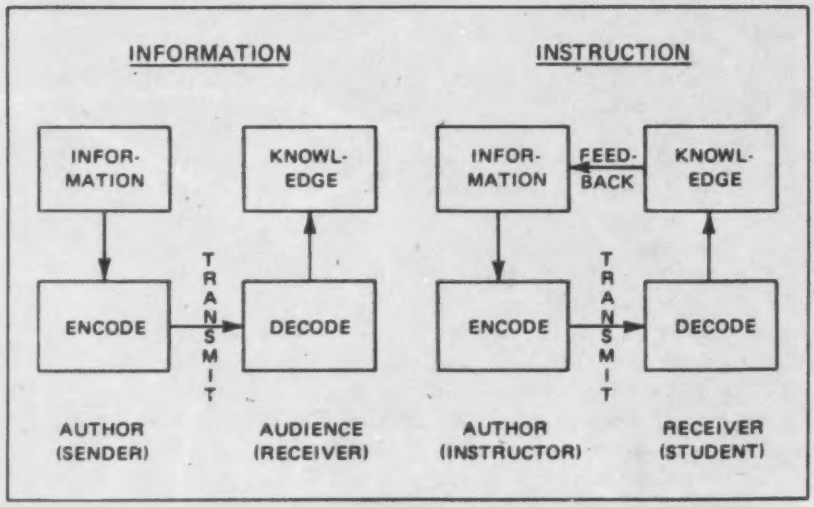
degrees of success, in our daily lives when we choose to communicate with others. We may choose to call someone or write a letter, or have face-to-face communication based on a number of variables. We even refine our selection more or go "multi-media" by feeling the need to include photographs or drawings or even imitate sounds in our messages.

The selection of instructional media should be an extension of the basic communication skill. It is only made more elaborate and somewhat more complicated because of the variety of "devices" available, size of target population, and the specific and measurable results required from the message. An all-encompassing algorithm for selecting appropriate media may not be practical as yet; but if we can at least narrow our choices and get into the right "ball-park," we will have a much greater chance of success.

EXPLANATION OF THE PROCESS

Decision 1. Information or Instruction.

All communication messages fall into one of two categories: Information (including entertainment) or Instruction. Each of these categories has sufficiently different characteristics which make them subject to different media choices. These processes may be simplified and diagrammed as follows:[3]



[3] Composite of two sources: Kemp (1968) and Bretz (1972).

Both processes go through the following steps:

1) Selecting of stored information (bits of unrelated data).
2) Encoding of information for transmission to target population.
3) Transmission of message to target audience. (With minimum amount of interference or distraction)
4) Decoding of message by student (or other receiver) into thought processes.
5) Storing of the message content as "knowledge " or discarding of the message.

In the case of instruction, a sixth step is added. A "feedback" loop is provided to determine how much of the intended message was received, decoded properly and stored by the student. This feedback loop is encoded in a pre-determined message form by the writer and becomes information for re-evaluating lesson materials, and the process starts over again.

The individual parts of the communication model may be roughly equated to the systematic approach to training in the following manner:

Communication Step	Systems Step
Information	— Task analysis, study of job performance, results of student tests, listing of S-R pairs, etc.
Encoding	— Preparation of objectives, criterion tests, and lesson content, determining training strategies, revision of materials based on "feedback."
Transmission	— Conducting developmental tests, distributing lesson material or content in any form.

It is this author's opinion that a great deal of time and energy is spent discussing "transmission" channels rather than considering this as only one input into the communication process — not the dominant factor.

A final comment on information: although information programs are not normally the responsibility of course developers, training writers can, at times, become involved in this process. For this reason two simplified flow charts are included dealing with selecting an informational medium based on message characteristics.

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One assumption is imposed on these information flow charts. Most of the informational material requested of course developers is akin to "affective" instruction and a change in the potential behavior of the target audience is usually desired. In these situations, it has been demonstrated rather conclusively that audio-motion visuals such as film and video are the most effective information media available — and the most expensive.

Decision 2: Instructional Aids or Instructional Media.

There are two basic forms of media available for instructional purposes, each having different capabilities for communicating message content:

1) Instructional Aids: those media capable of aiding a live instructor to produce learning.
2) Instructional Media: those media capable of providing a direct link between the developer and the student (excluding an instructor from the learning process).

Decision 3: Characteristics of lesson content and distribution.

After the first two decisions processes are completed, a set of conditions can be imposed on the lesson content and distribution requirements which can narrow the field of media choice considerably. By tracing through a series of questions imposed upon the lesson materials, a range of media can be established and ranked in a somewhat arbitrary order of availability, effectiveness and cost.

Decision 4: Categories of possible media.

All media can be categorized into ten arbitrary "classes" based on the inherent characteristics of each medium. Each medium has specific and limited capabilities for stimulus display, reproduction and distribution. In addition, each medium may also be categorized (individually, or in conjunction with other media) as either an instructional aid or medium.

These four decision processes are described in the Flow Charts at the end of this article. These Flow Charts are designed as decision guides for instructional designers. A Summary Flow Chart shows the overall decisions needed to select appropriate media. Seven detailed Flow Charts show the step-by-step procedures used in the making the decisions. A final Media Classification Chart classifies media into ten types and relates the type of media to the outcome of the decision-making process.

Once the field of media choices has been narrowed, the application of specific media to learning and the specific advantages and disadvantages of each medium can be explored. The development process may then begin. Steps outlining the development process are included in the remainder of the guide (Anderson, 1974) in the form of check lists. Again, a series of arbitrary questions have been imposed during the development stages of each medium. These "mind-joggers" will hopefully contribute to the effectiveness of the lesson material and reduce the time required by developers in producing lesson software.

COMMENTS

There may be some who will take exception to the arbitrary classes of media outlined in the Media Classification Chart (Figure 8 at the end of the article.) These critics may or may not be correct, only time will tell. However, there are two qualifications stated earlier in this guide that may help salve any wounds:

1) These media were classified only as they apply to the Illinois Bell Company.
2) In the preceding section, the tendency to consider this to be the last word in media was recognized — and disclaimed.

The capabilities of each medium listed in this section are also based on local production facilities. This is particularly true in the listing of video as a black and white medium, filmstrips and silent films as being infrequently used, and CAI not being suggested at all. Should production capabilities change at some later date, these priorities can be revised.

Finally, we have all seen examples of instructional materials produced in a medium that just shouldn't work (based on the information in this guide) — but it did. However, most of these materials were intentionally produced in the most economical medium by professional writers who were master craftsman.

If followed precisely, the decision process and development steps outlined in Figures 1-7 can be restrictive. However, this guide is not intended to limit the abilities of the expert, but to provide some guidance to the average course developer when selecting and developing instructional materials.

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FLOW CHARTS FOR SELECTION OF MEDIA

The decision-making process described in the preceeding article is illustrated in the following Flow Charts.

Summary Flow Chart. The Summary Flow Chart is the overall guide for using the seven other detailed Flow Charts and the Media Classification Chart.

Detailed Flow Charts.

Figure 1. Selecting media for information transmission to small groups.

Figure 2. Selecting media for information transmission to large groups.

Figure 3. Choosing between instructional aids (used to support an instructor) and instructional media (used without an instructor.)

Figure 4. Selecting media for instructional aids.
and 5.

Figure 6. Selecting media for instructional media.
and 7.

Media Classification Chart. Figure 8 is a chart which classifies media into ten types. It is used after the decision making process shown on the Flow Chart is completed.

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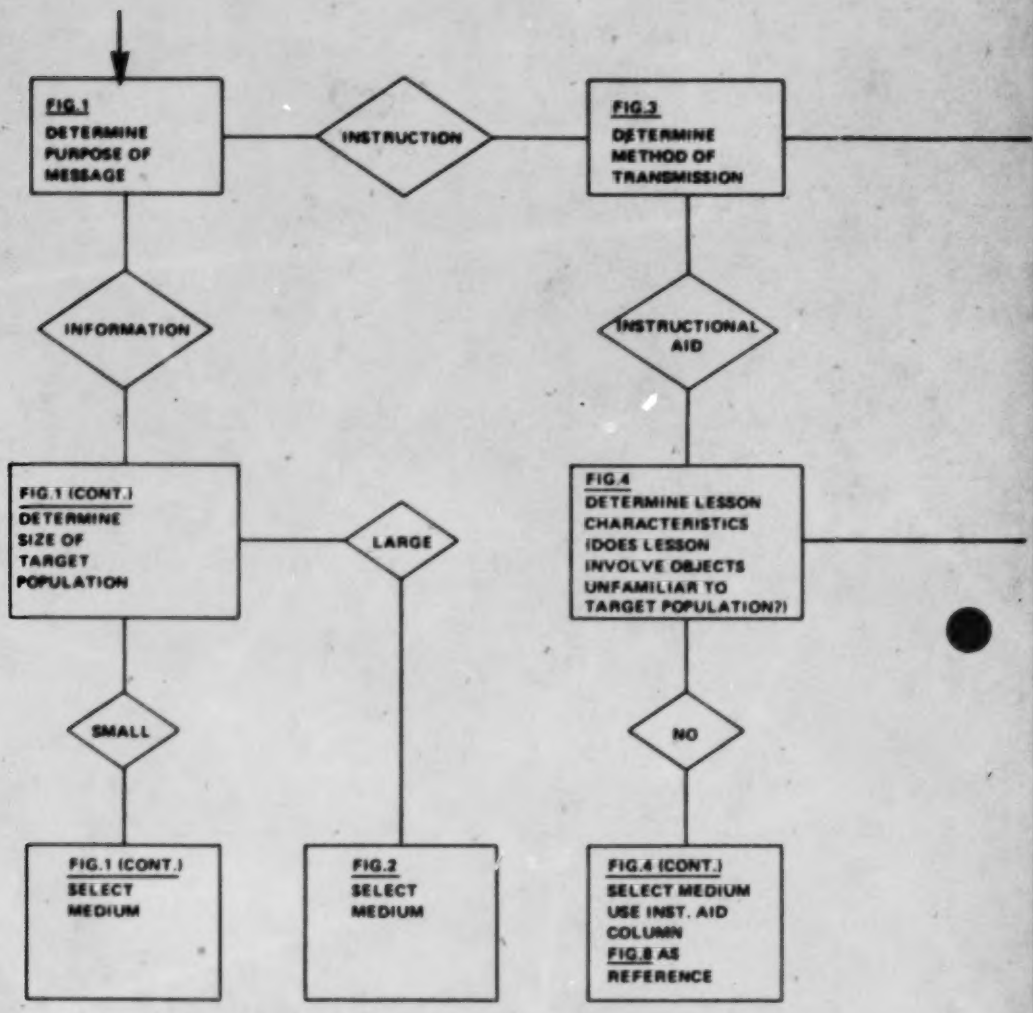
SUMMARY FLOW CHART

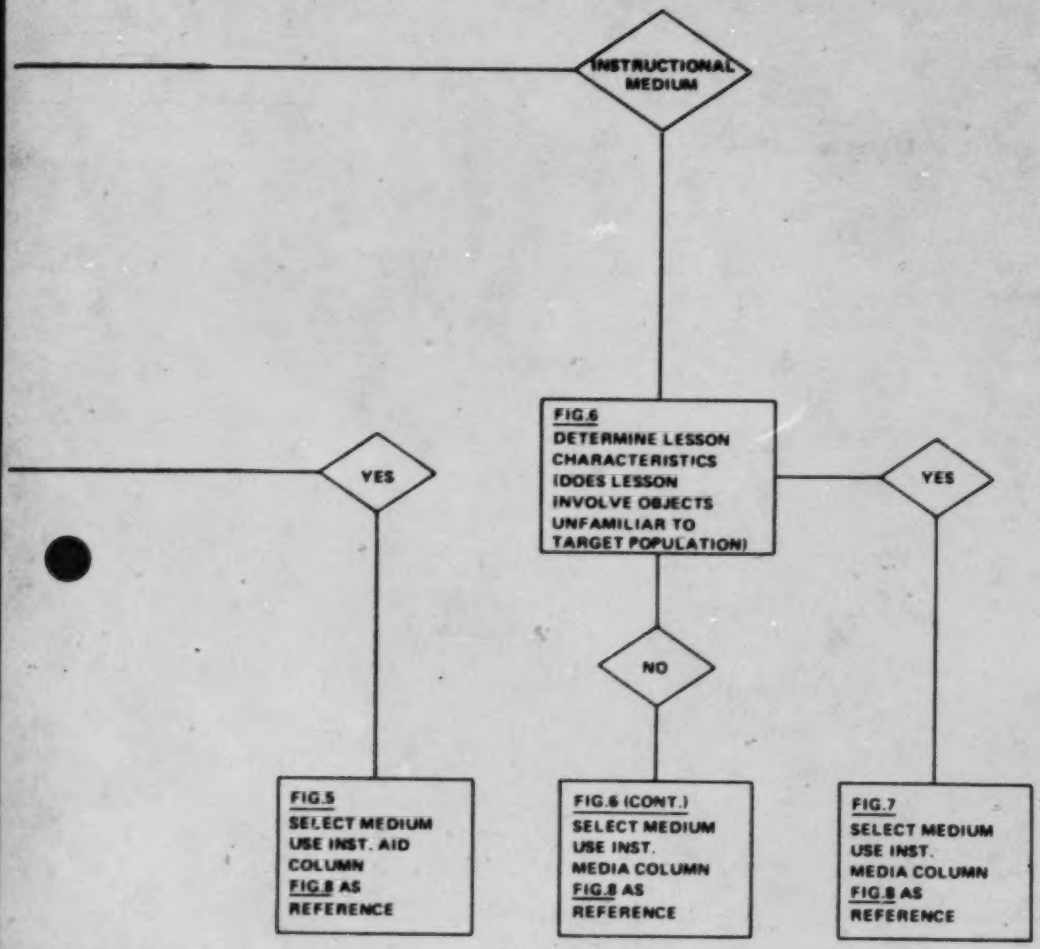
DECISION POINTS FIG. 1–8



AFTER SELECTION PROCESS IS COMPLETED, DEVELOPER WILL REFER TO SECTION DEALING WITH THE SPECIFIC MEDIUM SELECTED. THIS SECTION WILL PROVIDE:

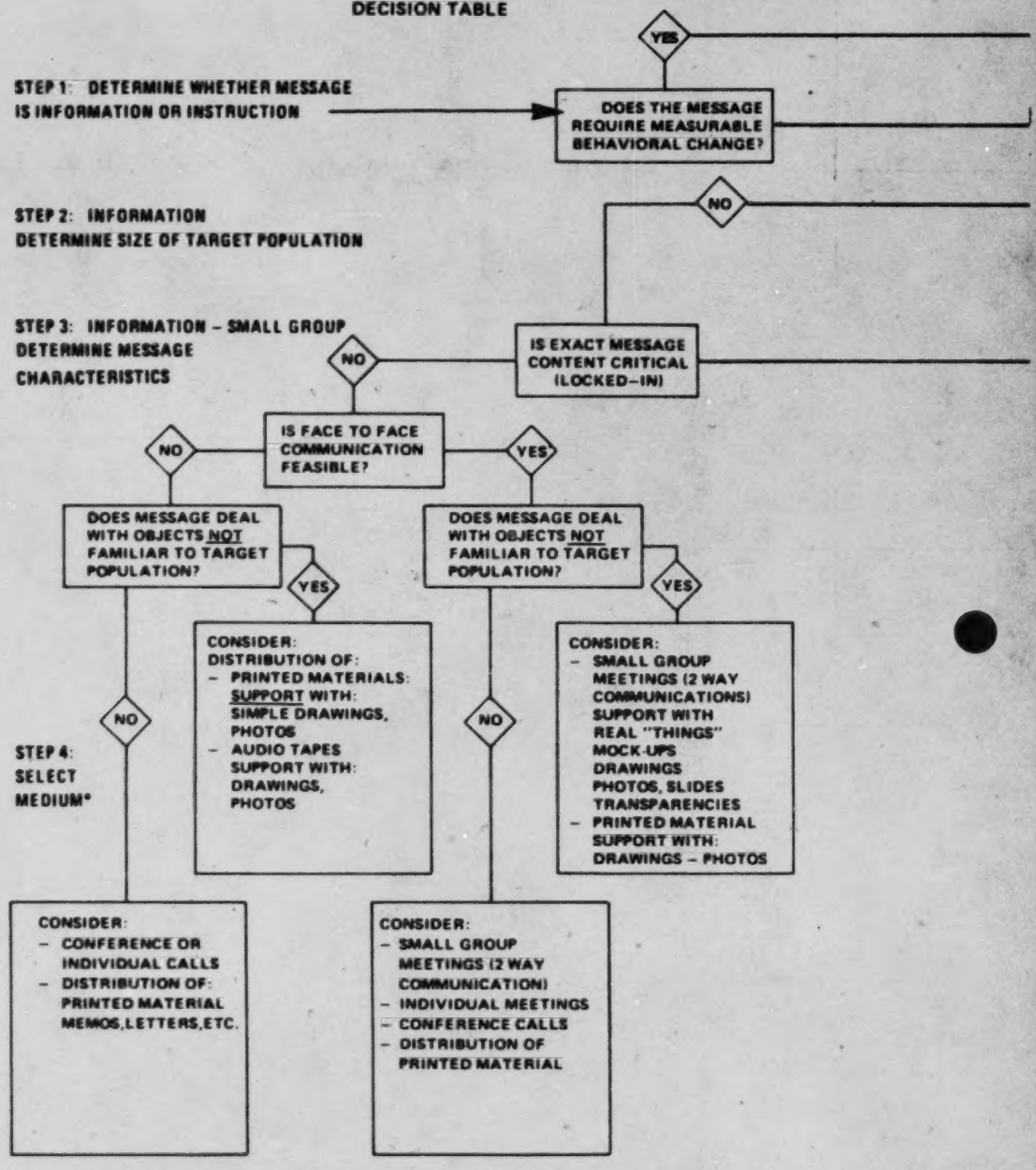
1) LIST OF ADVANTAGES AND DISADVANTAGES OF THE SELECTED MEDIUM.
2) APPLICATION TO TYPES OF LEARNING.
3) SERIES OF QUESTIONS FOR EVALUATING THE SELECTION.
4) CHECKLIST OF STEPS FOR PREPARATION AND DEVELOPMENTAL TESTING OF MATERIAL

Anderson, R. H.


INSTRUCTIONAL MEDIUM
FIG.6
DETERMINE LESSON CHARACTERISTICS (DOES LESSON INVOLVE OBJECTS UNFAMILIAR TO TARGET POPULATION)
YES
NO
YES
FIG.5
SELECT MEDIUM USE INST. AID COLUMN FIG.8 AS REFERENCE
FIG.6 (CONT.)
SELECT MEDIUM USE INST. MEDIA COLUMN FIG.8 AS REFERENCE
FIG.7
SELECT MEDIUM USE INST. MEDIA COLUMN FIG.8 AS REFERENCE

MEDIA SELECTION

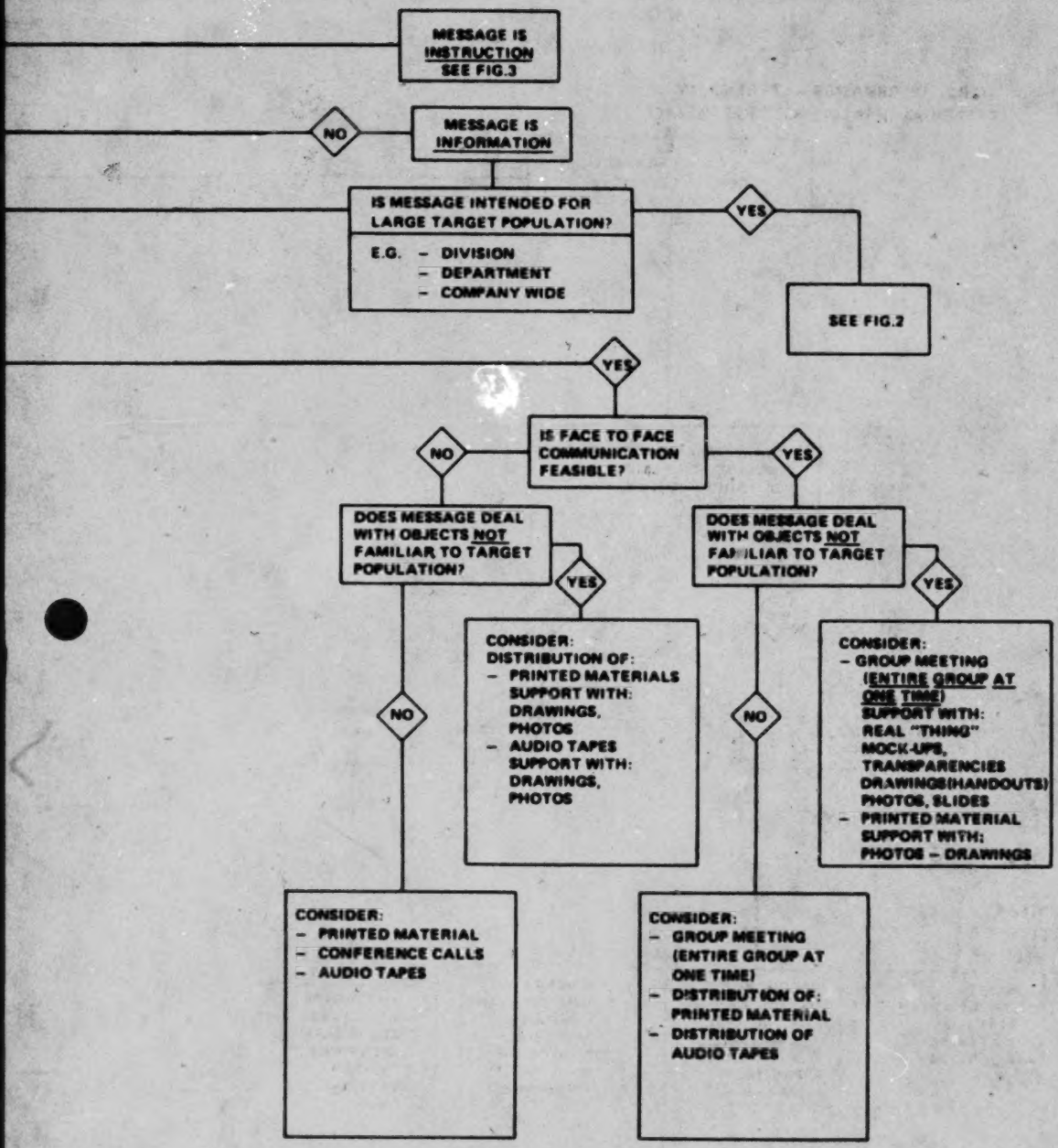
DECISION TABLE


STEP 1: DETERMINE WHETHER MESSAGE IS INFORMATION OR INSTRUCTION
DOES THE MESSAGE REQUIRE MEASURABLE BEHAVIORAL CHANGE?
YES
NO
STEP 2: INFORMATION DETERMINE SIZE OF TARGET POPULATION
STEP 3: INFORMATION – SMALL GROUP DETERMINE MESSAGE CHARACTERISTICS
IS EXACT MESSAGE CONTENT CRITICAL (LOCKED–IN)
NO
IS FACE TO FACE COMMUNICATION FEASIBLE?
NO
YES
DOES MESSAGE DEAL WITH OBJECTS NOT FAMILIAR TO TARGET POPULATION?
YES
CONSIDER: DISTRIBUTION OF:
- PRINTED MATERIALS: SUPPORT WITH: SIMPLE DRAWINGS, PHOTOS
- AUDIO TAPES SUPPORT WITH: DRAWINGS, PHOTOS
DOES MESSAGE DEAL WITH OBJECTS NOT FAMILIAR TO TARGET POPULATION?
YES
CONSIDER:
- SMALL GROUP MEETINGS (2 WAY COMMUNICATIONS) SUPPORT WITH REAL "THINGS" MOCK-UPS DRAWINGS PHOTOS, SLIDES TRANSPARENCIES
- PRINTED MATERIAL SUPPORT WITH: DRAWINGS – PHOTOS
NO
NO
STEP 4: SELECT MEDIUM*
CONSIDER:
- CONFERENCE OR INDIVIDUAL CALLS
- DISTRIBUTION OF: PRINTED MATERIAL MEMOS, LETTERS, ETC.
CONSIDER:
- SMALL GROUP MEETINGS (2 WAY COMMUNICATION)
- INDIVIDUAL MEETINGS
- CONFERENCE CALLS
- DISTRIBUTION OF PRINTED MATERIAL

* INDIVIDUAL MEDIA LISTED IN SUGGESTED ORDER OF PRIORITY

Anderson, R. H.

FIGURE I



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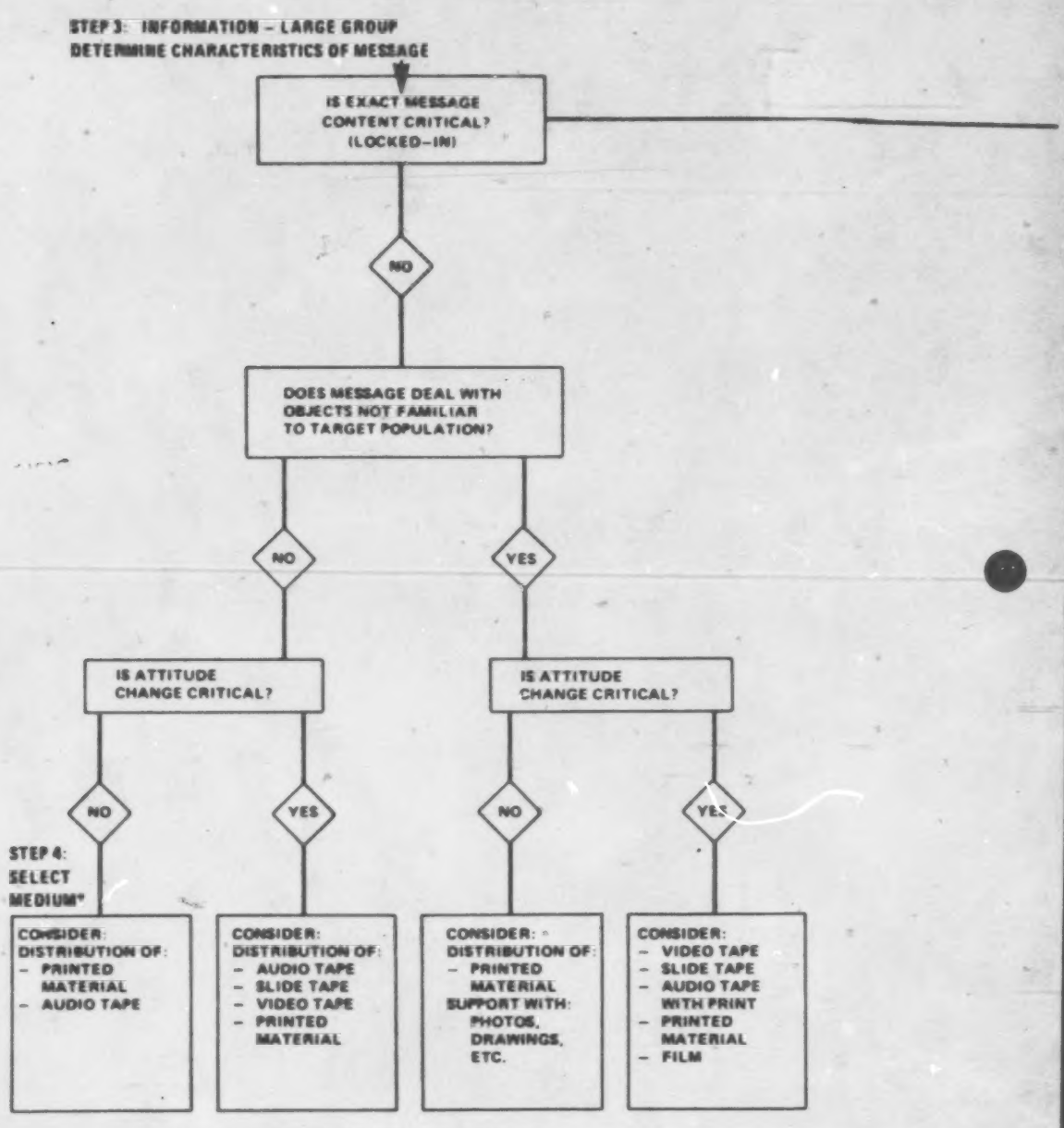
MEDIA SELECTION

DECISION TABLE


STEP 3: INFORMATION – LARGE GROUP
DETERMINE CHARACTERISTICS OF MESSAGE
IS EXACT MESSAGE CONTENT CRITICAL? (LOCKED–IN)
NO
DOES MESSAGE DEAL WITH OBJECTS NOT FAMILIAR TO TARGET POPULATION?
NO
YES
IS ATTITUDE CHANGE CRITICAL?
IS ATTITUDE CHANGE CRITICAL?
NO
YES
NO
YES
STEP 4: SELECT MEDIUM*
CONSIDER: DISTRIBUTION OF: – PRINTED MATERIAL – AUDIO TAPE
CONSIDER: DISTRIBUTION OF: – AUDIO TAPE – SLIDE TAPE – VIDEO TAPE – PRINTED MATERIAL
CONSIDER: DISTRIBUTION OF: – PRINTED MATERIAL SUPPORT WITH: PHOTOS, DRAWINGS, ETC.
CONSIDER: – VIDEO TAPE – SLIDE TAPE – AUDIO TAPE WITH PRINT – PRINTED MATERIAL – FILM

* INDIVIDUAL MEDIA IN SUGGESTED ORDER OF PRIORITY

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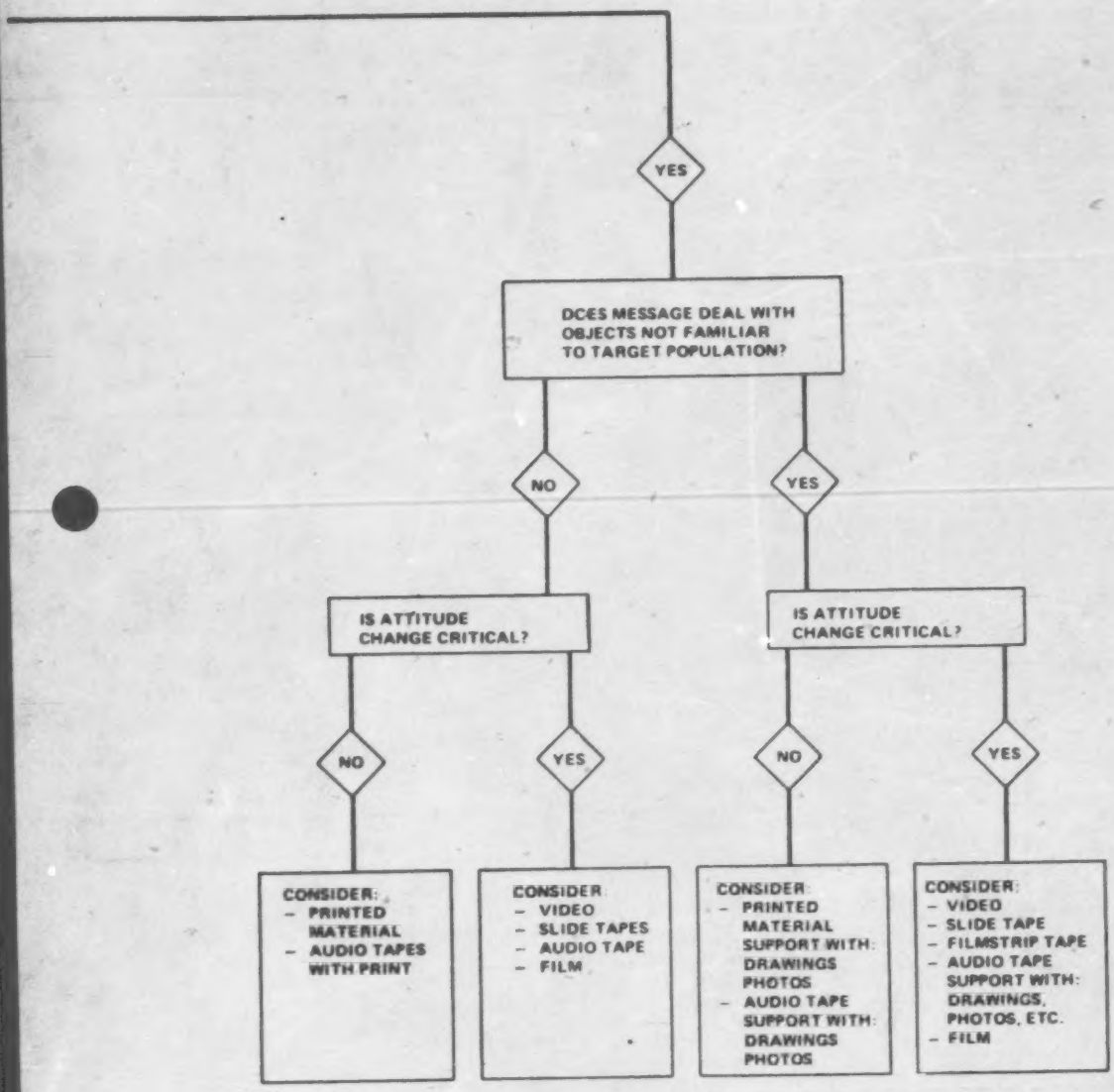
FIGURE 2



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MEDIA SELECTION

INSTRUCTIONAL MEDIA vs. INSTRUCTIONAL AID

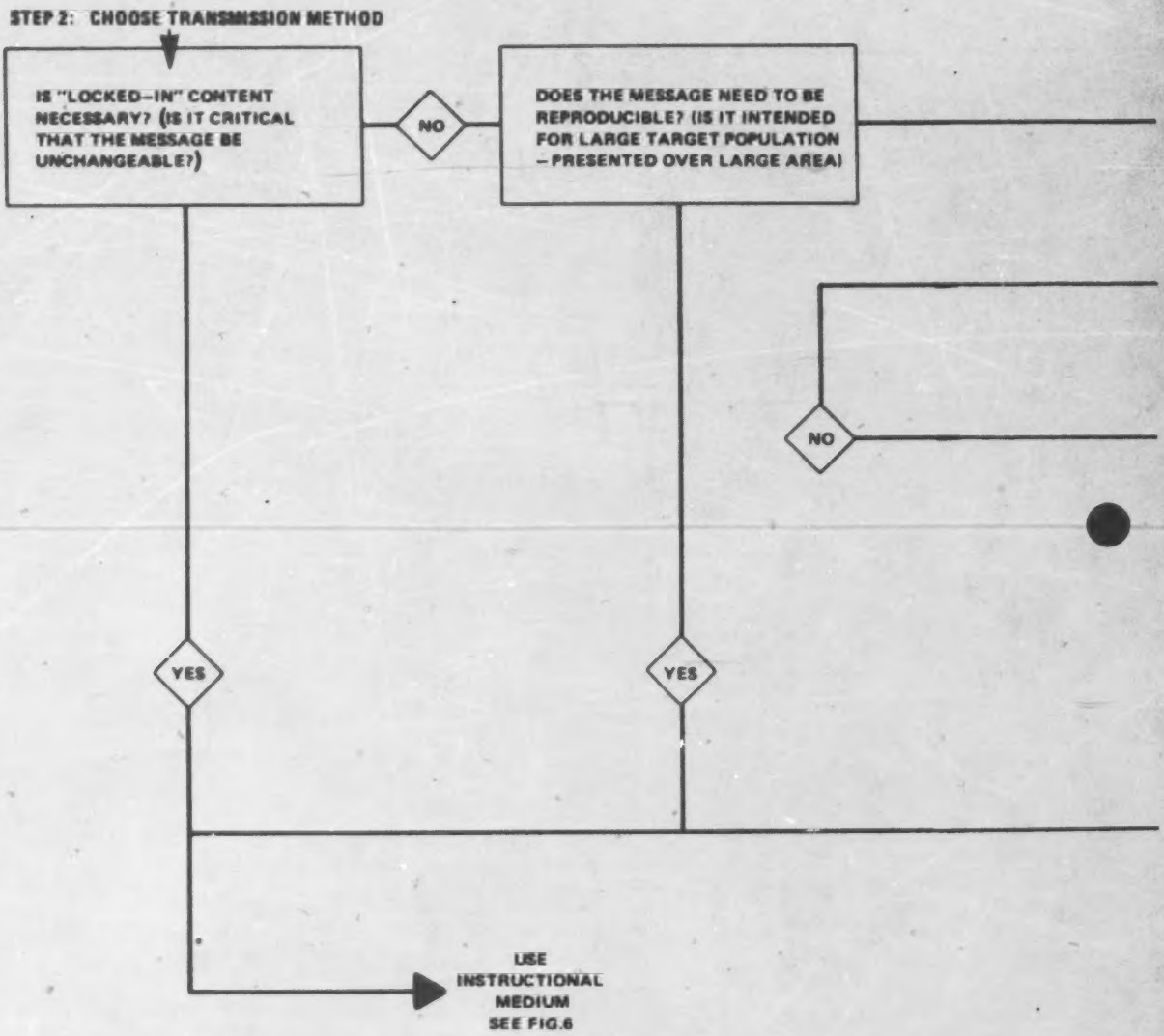
STEP 2: CHOOSE TRANSMISSION METHOD
IS "LOCKED-IN" CONTENT NECESSARY? (IS IT CRITICAL THAT THE MESSAGE BE UNCHANGEABLE?)
NO
DOES THE MESSAGE NEED TO BE REPRODUCIBLE? (IS IT INTENDED FOR LARGE TARGET POPULATION – PRESENTED OVER LARGE AREA)
NO
YES
YES
USE INSTRUCTIONAL MEDIUM SEE FIG.6

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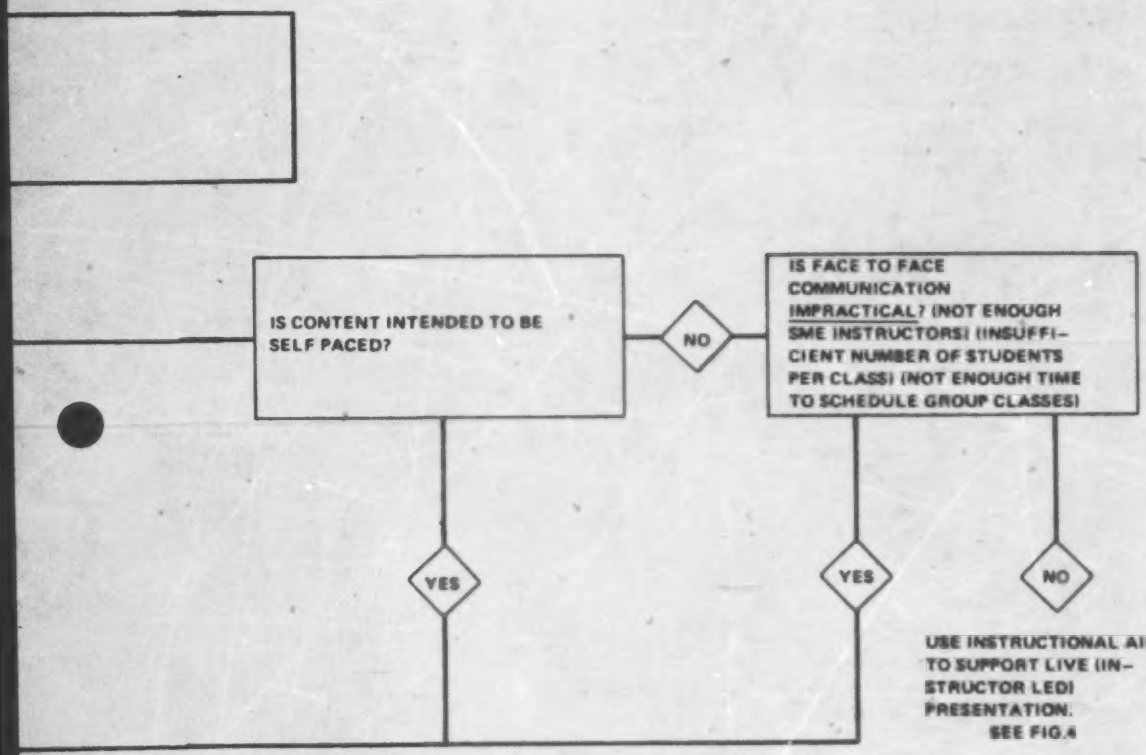
FIGURE 3


IS CONTENT INTENDED TO BE SELF PACED?
NO
IS FACE TO FACE COMMUNICATION IMPRACTICAL? (NOT ENOUGH SME INSTRUCTORS) (INSUFFICIENT NUMBER OF STUDENTS PER CLASS) (NOT ENOUGH TIME TO SCHEDULE GROUP CLASSES)
YES
YES
NO
USE INSTRUCTIONAL AID TO SUPPORT LIVE (INSTRUCTOR LED) PRESENTATION.
SEE FIG.4

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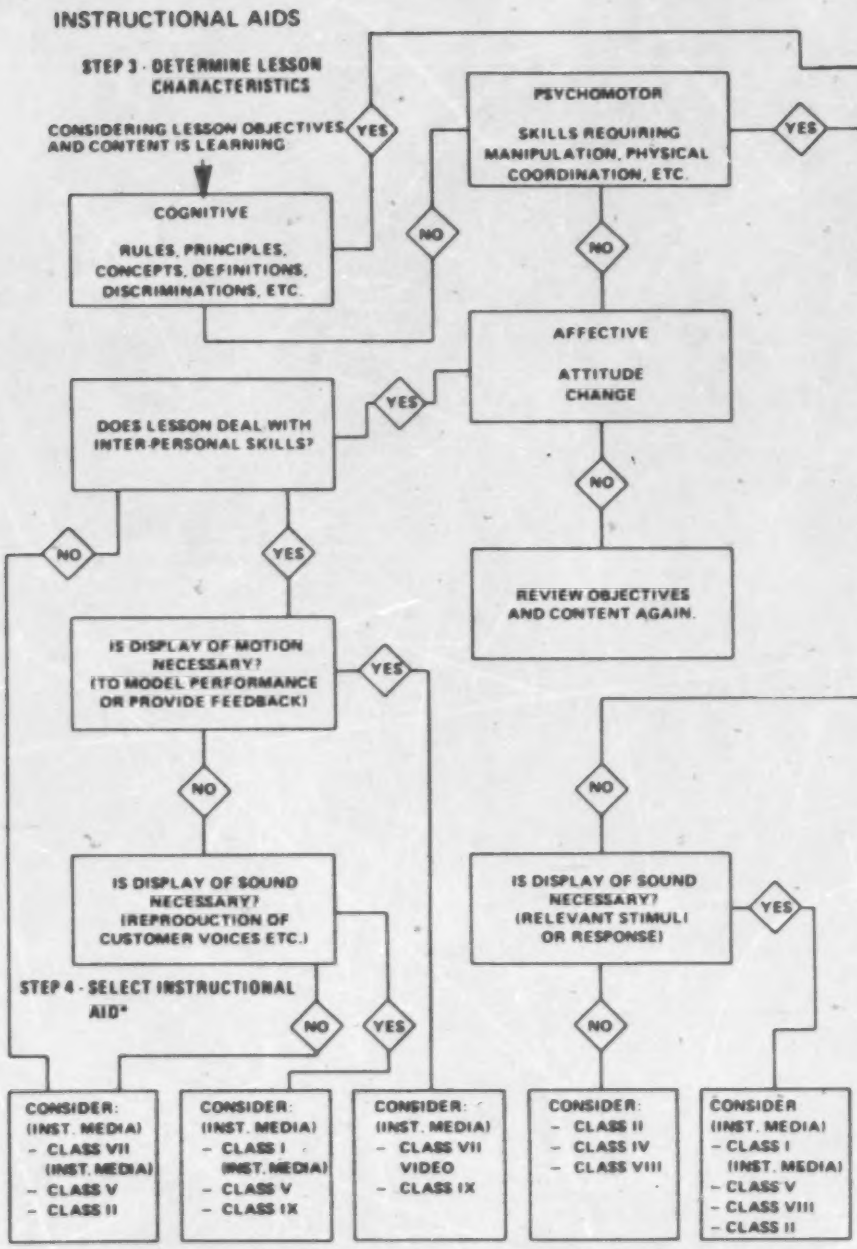
INSTRUCTIONAL AIDS
STEP 3 - DETERMINE LESSON CHARACTERISTICS
CONSIDERING LESSON OBJECTIVES AND CONTENT IS LEARNING
COGNITIVE
RULES, PRINCIPLES, CONCEPTS, DEFINITIONS, DISCRIMINATIONS, ETC.
YES
NO
PSYCHOMOTOR
SKILLS REQUIRING MANIPULATION, PHYSICAL COORDINATION, ETC.
YES
NO
AFFECTIVE
ATTITUDE CHANGE
YES
NO
DOES LESSON DEAL WITH INTER-PERSONAL SKILLS?
NO
YES
REVIEW OBJECTIVES AND CONTENT AGAIN.
IS DISPLAY OF MOTION NECESSARY? (TO MODEL PERFORMANCE OR PROVIDE FEEDBACK)
YES
NO
IS DISPLAY OF SOUND NECESSARY? (REPRODUCTION OF CUSTOMER VOICES ETC.)
NO
YES
IS DISPLAY OF SOUND NECESSARY? (RELEVANT STIMULI OR RESPONSE)
YES
NO
STEP 4 - SELECT INSTRUCTIONAL AID*
CONSIDER: (INST. MEDIA) - CLASS VII (INST. MEDIA) - CLASS V - CLASS II
CONSIDER: (INST. MEDIA) - CLASS I (INST. MEDIA) - CLASS V - CLASS IX
CONSIDER: (INST. MEDIA) - CLASS VII VIDEO - CLASS IX
CONSIDER: - CLASS II - CLASS IV - CLASS VIII
CONSIDER (INST. MEDIA) - CLASS I (INST. MEDIA) - CLASS V - CLASS VIII - CLASS II

* SELECTION LISTED IN SUGGESTED ORDER OF PRIORITY UNLESS IDENTIFIED AS INSTRUCTIONAL MEDIA. ALL SELECTIONS ARE FROM CLASS OF INSTRUCTIONAL AIDS FIGURE 8

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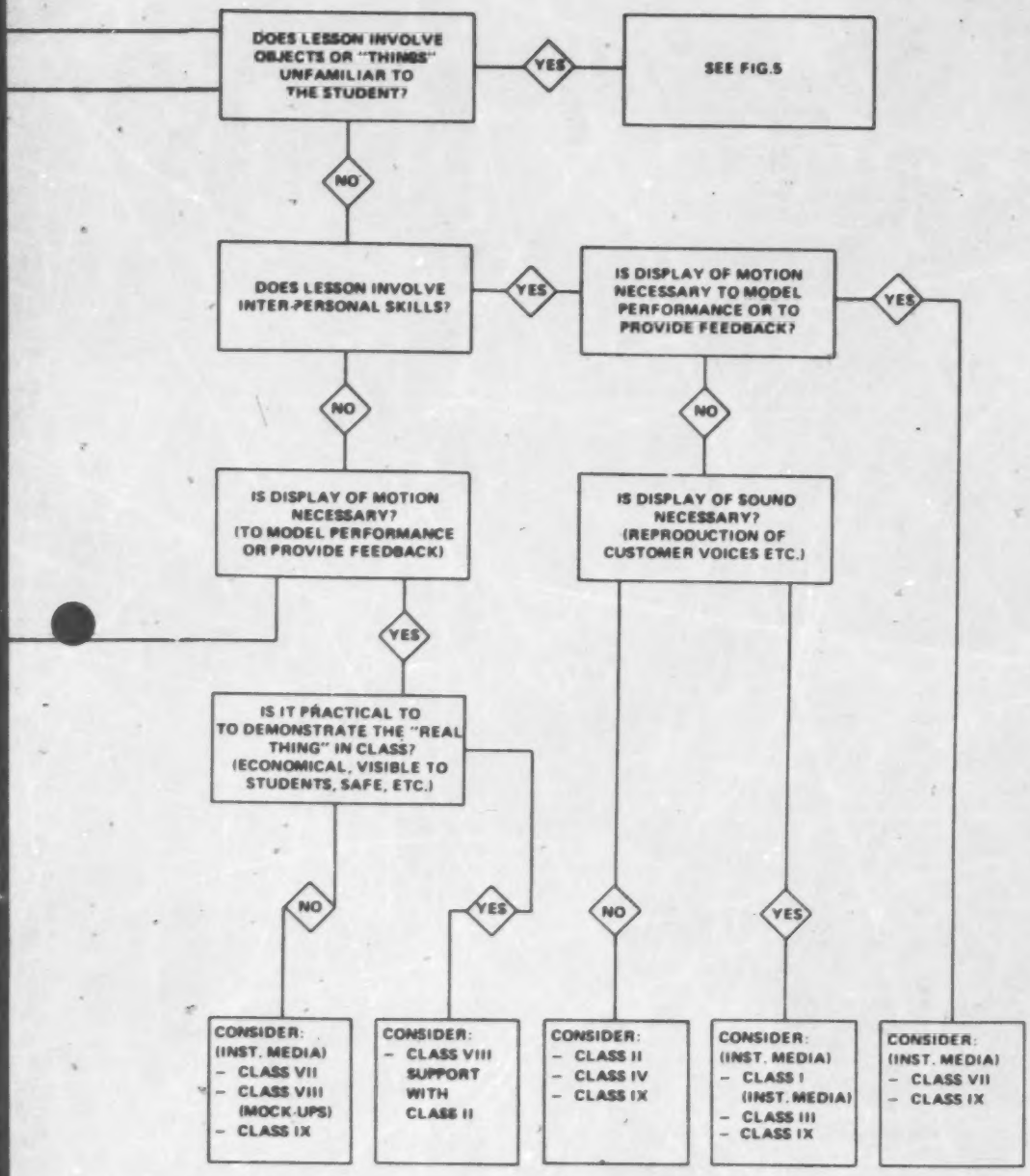
FIGURE 4


DOES LESSON INVOLVE OBJECTS OR "THINGS" UNFAMILIAR TO THE STUDENT?
YES
SEE FIG.5
NO
DOES LESSON INVOLVE INTER-PERSONAL SKILLS?
YES
IS DISPLAY OF MOTION NECESSARY TO MODEL PERFORMANCE OR TO PROVIDE FEEDBACK?
YES
NO
NO
IS DISPLAY OF MOTION NECESSARY? (TO MODEL PERFORMANCE OR PROVIDE FEEDBACK)
IS DISPLAY OF SOUND NECESSARY? (REPRODUCTION OF CUSTOMER VOICES ETC.)
YES
IS IT PRACTICAL TO TO DEMONSTRATE THE "REAL THING" IN CLASS? (ECONOMICAL, VISIBLE TO STUDENTS, SAFE, ETC.)
NO
YES
NO
YES
CONSIDER: (INST. MEDIA) – CLASS VII – CLASS VIII (MOCK-UPS) – CLASS IX
CONSIDER: – CLASS VIII SUPPORT WITH CLASS II
CONSIDER: – CLASS II – CLASS IV – CLASS IX
CONSIDER: (INST. MEDIA) – CLASS I (INST. MEDIA) – CLASS III – CLASS IX
CONSIDER: (INST. MEDIA) – CLASS VII – CLASS IX

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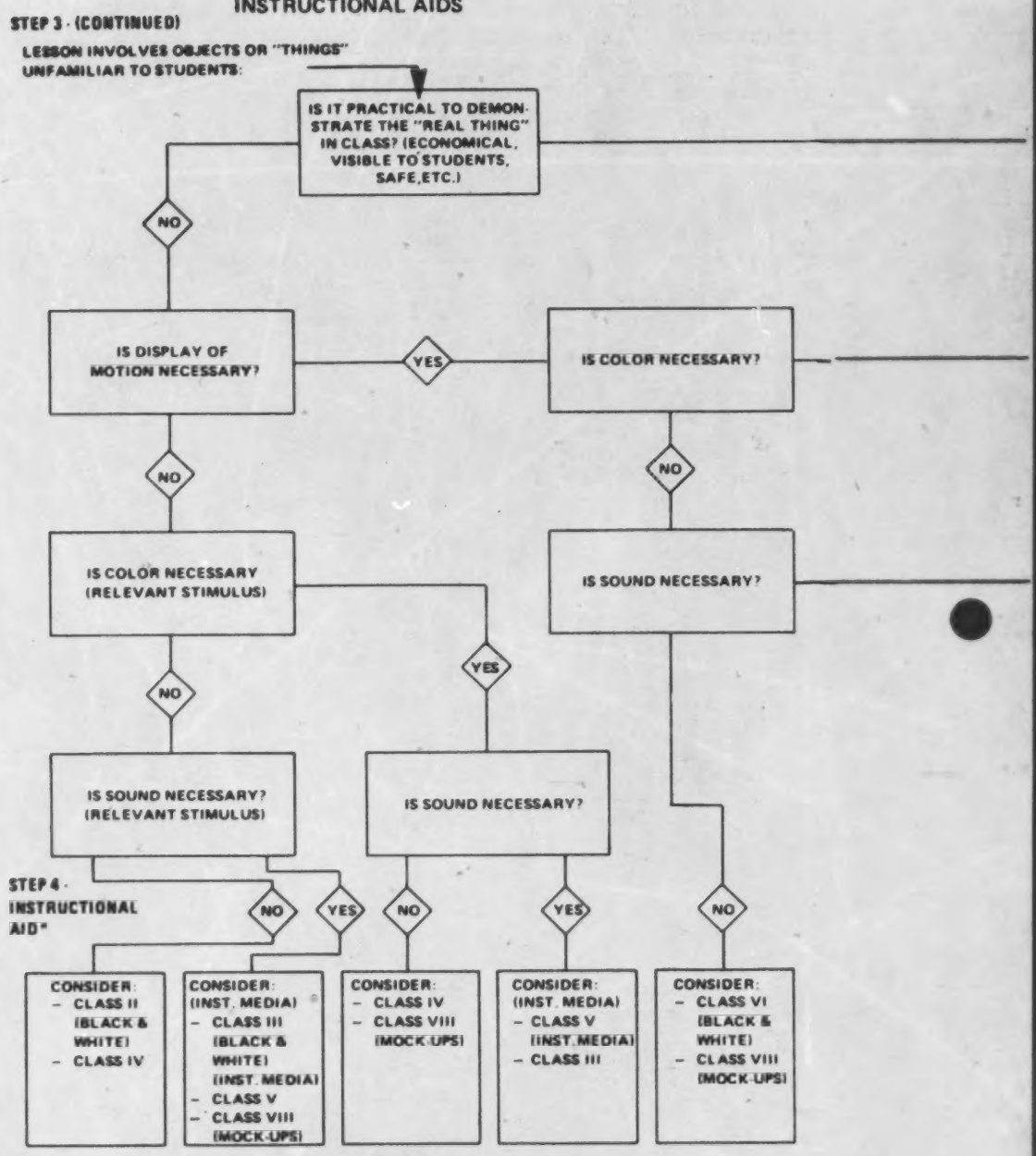
INSTRUCTIONAL AIDS



* SELECTION LISTED IN SUGGESTED ORDER OF PRIORITY, UNLESS IDENTIFIED AS INSTRUCTIONAL MEDIA. ALL SELECTIONS ARE FROM INSTRUCTIONAL AID CLASS. FIGURE 8

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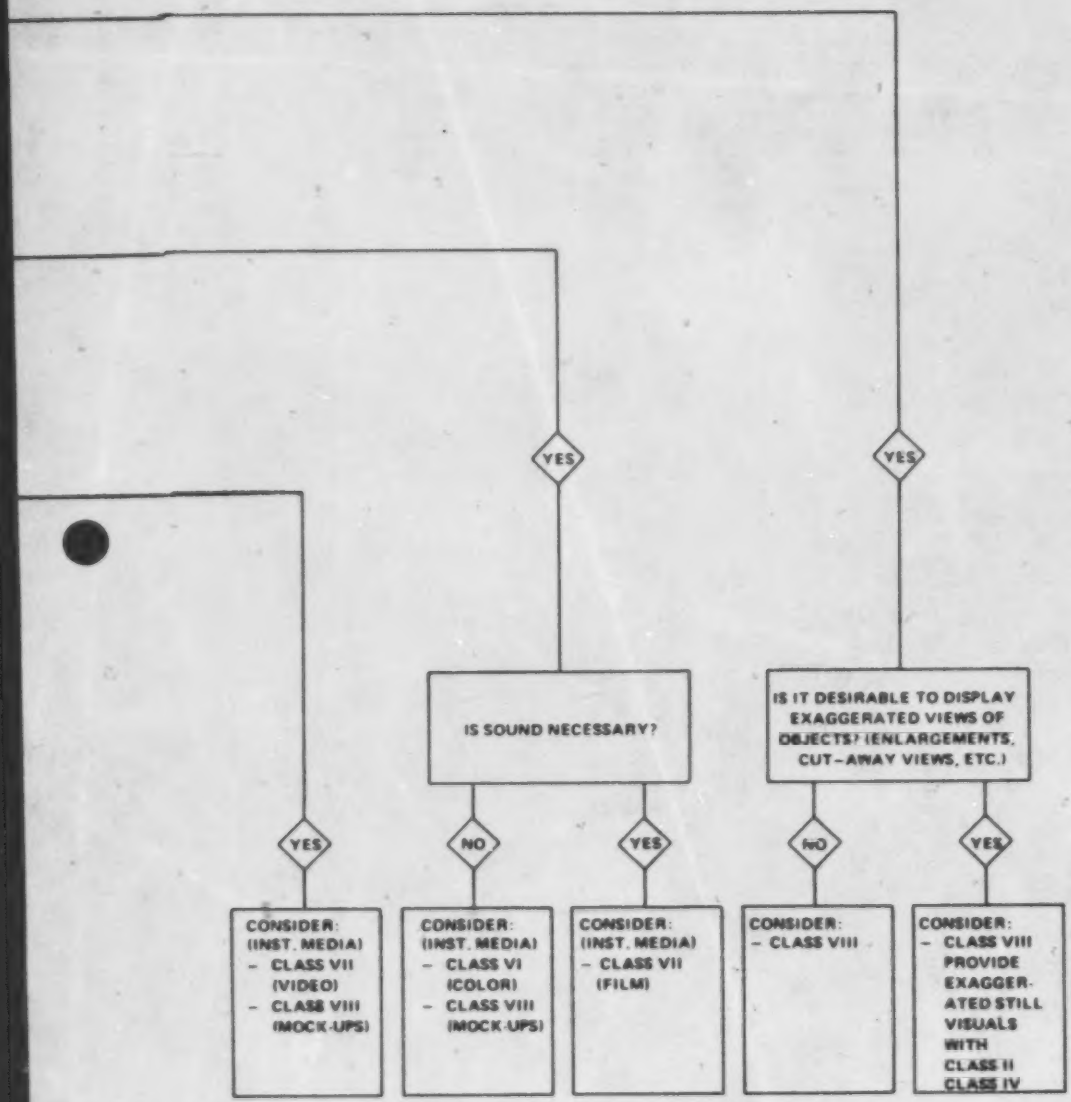
FIGURE 5


YES
YES
IS SOUND NECESSARY?
IS IT DESIRABLE TO DISPLAY EXAGGERATED VIEWS OF OBJECTS? (ENLARGEMENTS, CUT-AWAY VIEWS, ETC.)
YES
NO
YES
NO
YES
CONSIDER: (INST. MEDIA) - CLASS VII (VIDEO) - CLASS VIII (MOCK-UPS)
CONSIDER: (INST. MEDIA) - CLASS VI (COLOR) - CLASS VIII (MOCK-UPS)
CONSIDER: (INST. MEDIA) - CLASS VII (FILM)
CONSIDER: - CLASS VIII
CONSIDER: - CLASS VIII PROVIDE EXAGGERATED STILL VISUALS WITH CLASS II CLASS IV

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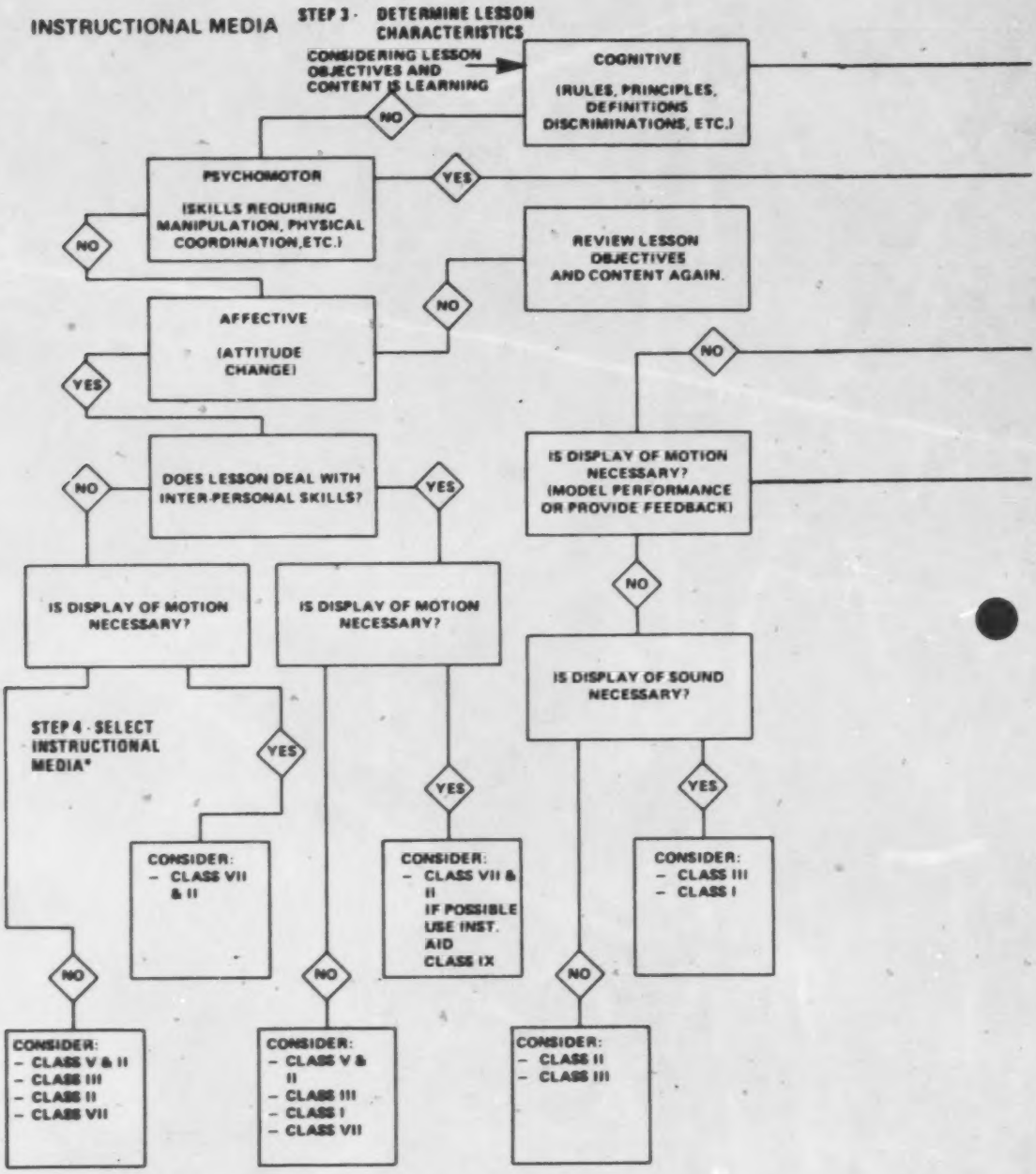

* ALL MEDIA ARE LISTED IN SUGGESTED ORDER OF PRIORITY – BUT NOT ALL INCLUSIVE

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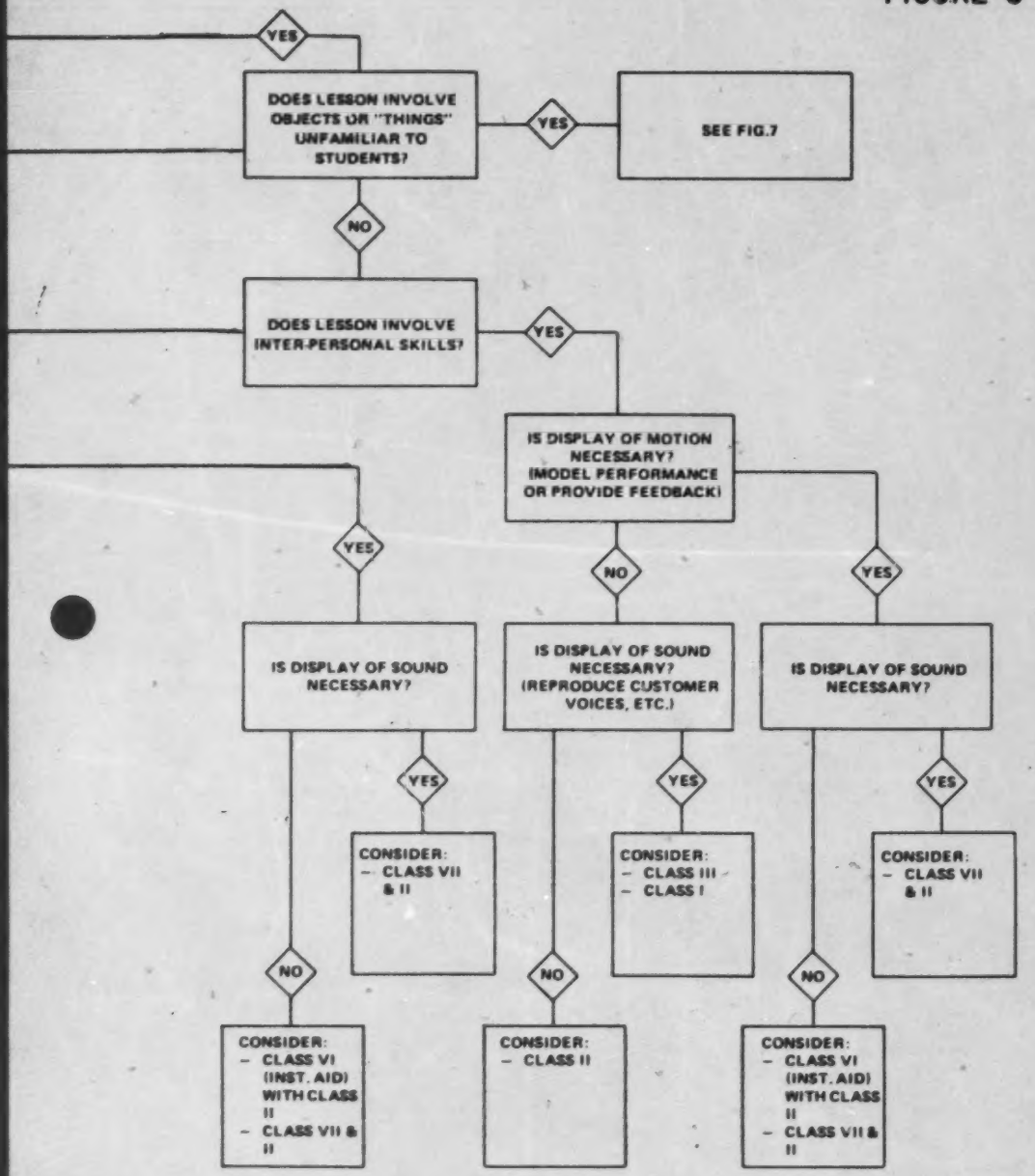
FIGURE 6



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INSTRUCTIONAL MEDIA

STEP 3 - (CONTINUED)

IS DISPLAY OF MOTION (EITHER REAL OR EXAGGERATED NECESSARY?
NO
IS COLOR NECESSARY? (RELEVANT STIMULUS)
NO
NO
IS SOUND NECESSARY? (RELEVANT STIMULUS)
IS IT PRACTICAL TO HAVE STUDENT INTERACT WITH THE "REAL THING"? (CONSIDER – DISTRIBUTION, COST, SAFETY, ETC.)
YES
NO
STEP 4 - SELECT INSTRUCTIONAL MEDIUM*
IS IT PRACTICAL TO HAVE STUDENT INTERACT WITH THE "REAL THING"? (CONSIDER – DISTRIBUTION, COST, SAFETY, ETC.)
IS IT PRACTICAL TO HAVE STUDENT INTERACT WITH THE "REAL THING"? (CONSIDER – DISTRIBUTION, COST, SAFETY, ETC.)
NO
YES
NO
YES
NO
YES
CONSIDER:
– CLASS II (BLACK & WHITE)
– CLASS III (BLACK & WHITE)
CONSIDER:
– CLASS VIII WITH CLASS II (BLACK & WHITE)
– CLASS VIII & CLASS I
– CLASS III (BLACK & WHITE)
CONSIDER:
– CLASS III (BLACK & WHITE)
– CLASS V & II
CONSIDER:
– CLASS VIII WITH CLASS II (BLACK & WHITE)
– CLASS V WITH CLASS II (BLACK & WHITE)
CONSIDER:
– CLASS V WITH CLASS II (BLACK & WHITE)
– CLASS II COLOR
CONSIDER:
– CLASS VIII & II (OR I)
– CLASS V & II

* SELECTION LISTED IN SUGGESTED ORDER OF PRIORITY - BUT NOT ALL INCLUSIVE

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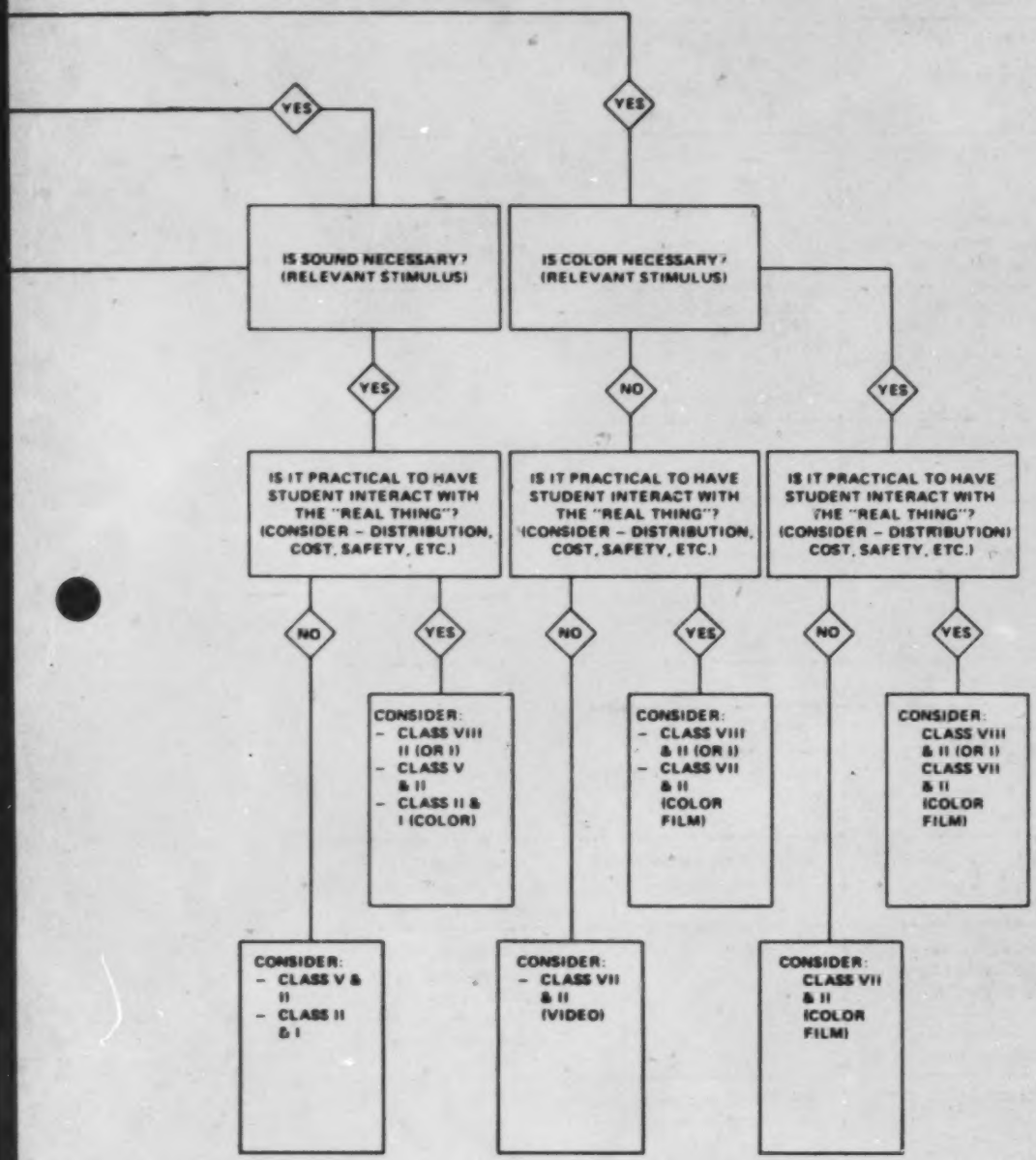
FIGURE 7


YES
YES
IS SOUND NECESSARY? (RELEVANT STIMULUS)
IS COLOR NECESSARY? (RELEVANT STIMULUS)
YES
NO
YES
IS IT PRACTICAL TO HAVE STUDENT INTERACT WITH THE "REAL THING"? (CONSIDER – DISTRIBUTION, COST, SAFETY, ETC.)
IS IT PRACTICAL TO HAVE STUDENT INTERACT WITH THE "REAL THING"? (CONSIDER – DISTRIBUTION, COST, SAFETY, ETC.)
IS IT PRACTICAL TO HAVE STUDENT INTERACT WITH THE "REAL THING"? (CONSIDER – DISTRIBUTION) COST, SAFETY, ETC.)
NO
YES
NO
YES
NO
YES
CONSIDER:
– CLASS VIII & II (OR I)
– CLASS V & II
– CLASS II & I (COLOR)
CONSIDER:
– CLASS VIII & II (OR I)
– CLASS VII & II (COLOR FILM)
CONSIDER:
CLASS VIII & II (OR I)
CLASS VII & II (COLOR FILM)
CONSIDER:
– CLASS V & II
– CLASS II & I
CONSIDER:
– CLASS VII & II (VIDEO)
CONSIDER:
CLASS VII & II (COLOR FILM)

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MEDIA CLASSIFICATION

FIGURE 8

MEDIA CLASS	INSTRUCTIONAL MEDIA	INSTRUCTIONAL AID
I. AUDIO (Sound Only)	– Audio Tape (reel to reel) (Cassette) – Audio disc – Radio (generally recorded "one-way" transmission)	– Telephone ("Live" person) – Radio (used in "two-way" dialogue)
II. PRINTED MATERIAL (All types of printed matter – including drawings and photographs)	– Programmed texts – Manuals – Job-aids	– Hand-outs – Easels – Chalkboards – Charts, Graphs, maps etc. used by instructor
III. AUDIO–PRINT (Combination of Class I & II)	– Student Workbook and audio tape or disc. – Forms, charts, reference materials etc. used with audio tape or disc.	—
IV. PROJECTED STILL–VISUALS		– Slides – Transparencies – Film strips – Holograms
V. AUDIO–PROJECTED STILL – VISUAL	– Sound filmstrip (Audio tape or disc and film strip) – Sound slide set (Slides of all types with audio tape or disc)	—
VI. MOTION–VISUAL		– Silent movie film
VII. AUDIO–MOTION VISUAL (Combination of Class I & II)	"Live" TV Sound movie film Video tape	Picturephone
VIII. PHYSICAL OBJECTS	(Not generally used in conjunction with instructional media)	– Actual objects – Mock-ups or models of the "real things"
IX. HUMAN AND SITUATIONAL RESOURCES (Teachers, peers, environment)		– Role play situations – Case studies using group members – Group participation in decision making – Field trips
X. COMPUTERS	CAI-CMI–Computers and various terminal display equipment	—

Anderson, R. H.

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American Institutes for Research Mongraph 2. *Instructional Media: A Procedure For The Design At Multi-Media Instruction, A Critical Review Of Research, And Suggestions For Future Research.s, Pittsburg: American Institutes for Research, 1966.*

Anderson, R. H. *Media Guidelines.* Chicago: Illinois Bell Telephone Co. Training and Development Department, 1974.

Bretz, R. A. *A Taxonomy of Communication Media.* Educational Technology Publications, 1972.

Commission On Instructional Technology — *To Improve Learning.* A report to the President and the Congress of the United States. Washington, D.C.: U.S. Government Printing Office, 1970.

Kemp, J.E. *Planning and Producing Audio Visual Materials — Second Edition.* Scranton: Chandler Press 1963.

Commercial Instructional Materials

When there is no time to prepare instructional materials (which is often the case), the alternative is to buy commercially prepared ones. However, you won't want to make the final decision to buy until you have reviewed the materials for quality and appropriateness to the purpose you have in mind. The Media Evaluation Form provided on the next page is a good checklist device to use when deciding whether or not to buy.

9. Select any form of instructional media available in the classroom. Using the Media Evaluation Form, review the instructional material you selected to determine its quality. Then answer these questions.

    a. Based on your review of the instructional material, would you buy it? What was the major factor in arriving at your decision?

    b. Did you find the Media Evaluation Form useful? If not, how would you improve it?

(See Appendix A for possible answers.)

MEDIA EVALUATION FORM

D. L. Jelden
Industrial Arts Department
University of Northern Colorado
Greeley, Colorado

MEDIA TYPE:

16 mm film (initial contact) _____
16 mm film (accelerated) _____
program (initial contact) _____
program (accelerated) _____
programmed text _____
programmed film/filmstrip _____
filmstrip _____
tape-slide _____
video tape (tv) _____
8 mm loop _____
lab manual _____
lecture demonstration _____
audio tape _____
other _____

PRODUCER _____

TIME/LENGTH _____

COLOR/BW _____

	COMMENTS	RATING Excellent	Good	Poor
PHOTOGRAPHIC QUALITY				
Picture quality		☐	☐	☐
Photographic technique		☐	☐	☐
SOUND QUALITY				
Tonal quality		☐	☐	☐
Clarity		☐	☐	☐
Ability of narrator		☐	☐	☐
CONTENT				
Vocabulary level		☐	☐	☐
Accuracy		☐	☐	☐
Is material dated		☐	☐	☐
Organization		☐	☐	☐
Continuity		☐	☐	☐
Educational aids used (models, etc.)		☐	☐	☐
Level suitable for use		☐	☐	☐
Does it achieve stated objective		☐	☐	☐
GENERAL ☐		☐	☐	☐
SPECIFIC ☐		☐	☐	☐

COMMENTS: _____

_____

Evaluated by _____ Date _____

Content Outline	Activities-Resources
Goal 8.2: Organize Instruction.	
A. Principles of Curriculum Organization	
1. According to Larson and Valentine, curriculum for vocational education should be organized based on the following premises:	
a. Preparation for initial job-entry is the basic responsibility of the public education program.	
b. The curriculum must be goal-centered for youth at age 14 and above. For the majority of youth this goal can be most meaningful when related to preparation for employment.	(15) Vocational Education Curriculum Development Handbook.
c. Curriculum changes are demanded in order to make curriculum more relevant to the social and economic conditions of our day and the maturity of the youth.	
d. A core curriculum concept based on the occupational goal of the student can provide both a meaningful preparation for employment and a means of educating youth to participate effectively in our technological society.	
e. A curriculum for the future will concern itself not only with the need for knowledge and skills but with the total educational, economic, social, and physical needs of each student (15).*	* See Classroom Activity 4 in Part III.

B. Sequence of Instruction

1. Before developing actual course materials, the supporting knowledge and skills that are essential to performance must be organized. Course content has to be structured and sequenced in the best possible order for learning if the system is to be effective and efficient.
2. According to Butler, content sequence is based on a combination of two different levels of organization:
   a. a general sequence based on job/task structure;
   b. a more specific sequence based on learning structure. (This refers to the internal learning events--supporting skills and knowledge--within each of the main job-sequenced events) (6).
3. Various techniques exist for sequencing instruction. The important point to remember is that initial sequencing should be considered only as preliminary; student performance data collected during the "test-revise-retest" cycle will determine the final sequence.
4. Smith recommends a "functional context" sequencing, a principle tested in a number of research studies and shown to be capable of reducing failure, especially among students

(6) Instructional Systems Development for Vocational and Technical Training, Chap. 11. For a matrix technique to sequencing instruction, see p. 115.

who are relatively low in aptitude. The essential ideas of functional context sequencing are these:

a. The student is given a meaningful orientation to the entire job for which he is being trained.
b. Other topics are organized so that the relevance of each to the whole job can be demonstrated to the student at the time it is being taught.
c. A whole-to-part sequence is followed in teaching the functions of equipment.
d. Each student learns a graded series of job tasks. Each new task to be learned requires the student to master new knowledge and skills (24).

(24) Innovations in Teaching and Training, Chap. 5.

5. A less meaningful sequence cited by Smith is beginning a course with a block of "fundamentals." On analysis, these fundamentals usually turn out to be component knowledge and skills for task performance. Task performance is then taught later in the course. By taking component knowledge and skills out of the context of the tasks to which they are related, they become less meaningful to the student and more difficult to learn. The student has difficulty identifying the purpose of these "fundamentals" (24).

C. The Lesson Plan

1. The lesson plan is the final link in the instructional planning process. Focusing on a given topic, theme, or instructional objective, it provides the instructor with detailed directions for carrying out the instructional process.
2. A good lesson plan gives the instructor confidence while teaching, and helps to:
   a. provide needed motivation;
   b. give proper emphasis to the various parts of the lesson, including those requiring student activity;
   c. ensure that all essential information is included;
   d. provide for the use of instructional aids;
   e. insert questions at the proper time; and
   f. remain within a schedule (18).

(18) Instructors and Their Jobs, Chap. 5.

3. Lesson plan formats vary from instructor to instructor. The important concern is that both instructor and student activity be reflected.
4. The specificity of lesson plans also varies from instructor to instructor. Some, usually inexperienced teachers, write very detailed lesson plans. Others write a detailed plan as a means of preparing themselves and then reduce it to a few notes and a time schedule for use in the classroom.*

* See Discussion Question H in Part III.

D. Wrapup of Module*

* See Discussion Question I in Part III.

E. Study Activities

Based on your reading of the content outline and any additional references as suggested, complete the following activities.

1. Read Chapter 3: "How Can Learning Experiences Be Organized for Effective Instruction?" in Tyler, Basic Principles of Curriculum and Instruction. Then answer the following questions.

   a. What are the three major criteria for effective organization of instruction as identified by Tyler? Briefly describe each in terms of a single course, providing examples from vocational education.

   b. What are some common principles of organization used in school curricula as identified by Tyler? After you have listed these, try to think of other organizing principles--there are many possibilities.

   c. What organizing principle is used in the course in which you are studying this module?

   d. What organizing principles are used in the other courses in which you are currently enrolled?

2. Read Chapter 10: "Sequencing Instructional Units" in Mager and Beach, Developing Vocational Instruction. Then complete the following multiple-choice questions by marking an "X" at the appropriate choice.

   a. If instruction is organized to teach the skills most often used on a job, what type of sequencing does this represent?

      _____a. general to specific sequencing

      _____b. interest sequencing

      _____c. logical sequencing

      _____d. skill sequencing

      _____e. frequency sequencing

      _____f. total job practice

b. If instruction is organized to move from the big picture to the details, what type of sequencing does this represent?

_____a. general to specific sequencing

_____b. interest sequencing

_____c. logical sequencing

_____d. skill sequencing

_____e. frequency sequencing

_____f. total job practice

c. If instruction is organized to present what "needs to be known" about a job and then followed by what is "nice to know" about that job, what type of sequencing does this represent?

_____a. general to specific sequencing

_____b. interest sequencing

_____c. logical sequencing

_____d. skill sequencing

_____e. frequency sequencing

_____f. total job practice

d. If an instructor is faced with a particularly unmotivated group of students, what type of instructional sequencing would be most appropriate?

_____a. general to specific sequencing

_____b. interest sequencing

_____c. logical sequencing

_____d. skill sequencing

_____e. frequency sequencing

_____f. total job practice

3. Read Chapter 11: "Lesson Plan Development" in Mager and Beach, Developing Vocational Instruction. Then complete the following activity.

The purpose of this activity is to provide you with an opportunity to apply the techniques and processes you learned in this module and the previous one (Module 7: Derivation and Specification of Instructional Objectives). Be sure to have your completed Study Guide for Module 7 on hand as you do this activity.

Develop a lesson plan for a unit of instruction that will prepare students for the occupation you selected in Module 7. Follow the seven general steps for lesson plan development as described by Mager and Beach. You may choose to use the lesson plan form they suggest, or you may prefer another one. The important thing is to use a form that identifies what the student will be doing during each phase of instruction.

As you complete this activity, be aware of the unrealities of the situation. You do not know the group of students for whom you are preparing the instruction, and you do not know the administrative constraints. However, you have learned some processes and techniques which you should now be able to apply.

When you have completed the activity, review it with your instructor. If your instructor is not an expert in the area you have selected, he will comment only on the processes and techniques you have used. If he is an expert, he will be able to comment on the content of your instruction as well.

Use additional sheets of paper as space is not provided in this Study Guide. Also, feel free to use any other reference materials you might need to assist you in completing this activity.

Part III:

Group and Classroom Activities

PART III

GROUP AND CLASSROOM ACTIVITIES

Classroom Activities

NOTE: The following activities are designed to stimulate discussion in the classroom on specific topics covered in this module. The activities are designed to be used after student self-study; however, depending on the background and abilities of students, these activities may not require previous self-study. All classroom activities are keyed to the content outline to indicate an appropriate point for participation.

1. In the Anderson article in the Study Guide, "Selection of Media: Another Perspective," the author states that the selection of instructional media should be an extension of basic communication skills. According to Anderson, "We exercise this process, with varying degrees of success, in our daily lives when we choose to communicate with others. We may choose to call someone or write a letter, or have face-to-face communication based on a number of variables. We even refine our selection more to go 'multi-media' by feeling the need to include photographs or drawings or even imitate sounds in our messages…"

   The purpose of this classroom activity is to have you think about your personal communication techniques and apply them to the problem of selecting instructional strategies. Think of an instance when you communicated with another individual. By which medium--letter, phone, face-to-face, etc.--did you communicate? What were the reasons for the selection of one medium over another? List these reasons, and then analyze them to determine if general statements can be formulated which might apply to the selection of instructional strategies.

2. In class, discuss the issue of commercially prepared materials vs. instructor-prepared materials. Cite advantages and disadvantages of both types of materials. For example, commercially prepared materials often do not meet the specific instructional objectives established by the instructor. Because commercial enterprises are profit-oriented, their materials must appeal to a larger audience, thereby missing the specific needs of smaller groups. However, the instructor rarely has the time to prepare all of his own instructional materials and for this reason occasionally needs to rely on commercially prepared ones.

3. Select some form of commercially prepared visual media, particularly a film that was prepared for any vocational class at the secondary level. In class, review the film. Then evaluate it, using the criteria provided in the content outline: content, level, presentation, authorship, technical quality. Make a final decision regarding whether or not to buy the film.

4. In class, discuss the organization of the course in which you are using this module. Identify the elements of the course which serve as the organizing threads: for example, concepts, values, and skills. See reference (26), Basic Principles of Curriculum and Instruction, page 86. Also identify the organizing principles by which the elements are woven together. See reference (26), page 95. Then analyze the structural organization in which the course exists. See reference (26), page 98.

Activities for Additional Credit

NOTE: These activities are designed for the student who wishes to obtain additional credit beyond the basic requirements of this module.

You may choose to write a paper on one of these activities, or discuss the activity with the instructor, or you may select some other method to complete the activity.

1. Observe a class session in a vocational course of your choosing. List statements, actions, or other evidence of the following:
   a. students were encouraged to present viewpoints differing from or in conflict with ideas under discussion;
   b. opportunities for group involvement;
   c. topic was related to the outside world and the social scene;
   d. teacher identified students having difficulties;
   e. questions challenged student thinking or values;
   f. class activities were related to student problems, interests, and needs.

2. Observe a class session in a vocational course of your choosing. List the various teaching methods and media devices used. Evaluate the selection of these methods and devices on the basis of the instructional objectives for the particular learning activities.

3. Collect five samples of lesson plans. Evaluate these plans on the basis of content. Do they contain all the essential elements of a good lesson plan? What would you recommend to improve them?

4. Study a lesson plan, and then observe the lesson taught from it. How did the teaching differ from the plan, if it differed at all? What changes would you have suggested?

Discussion Questions

A. What factors are important in the development of sound instructional materials for vocational education?

(Certainly one of the most important factors in the development of sound instructional materials in vocational education is timeliness. Instruction for an occupation should be based on the current state of the art of that occupation and on any future projections that have been made for that occupation.)

B. How might emerging trends in curriculum development for vocational education affect the role of the curriculum specialist?

(The curriculum specialist might be a member of a team--or the team leader--of a massive, funded project, working for a larger administrative organization than the single school. Members of this curriculum team might include persons with varied talents. The curriculum specialist himself would need to develop broader abilities that would allow him to work effectively with a team.)

C. What are some possible reasons for the preoccupation of vocational curriculum specialists (and other instructional developers) with developing a variety of instructional activities without regard for the instructional objectives?

(Possible reasons might include:

a. With the emphasis in some educational circles on appealing to student interests, curriculum specialists may get carried away with creating exciting activities that may have no direct relation to instructional objectives.
b. Instructional activities are fun to develop. And since an instructional objective may limit the imagination of the developer, he may disregard it.)

D. Why are administrative criteria important to consider in selecting instructional strategies? Provide one example of how these criteria influence the selection of such strategies.

(Administrative criteria set the limits on what is practical and what is within the budget. The most appropriate instructional strategy for an instructional objective may simply not be practical or within the school budget. For example, suppose that an objective calls for a student in a retail sales course to deal pleasantly with a customer. The most appropriate instructional strategy is a roleplaying session, using videotape equipment. The videotape can replay the session and the student can watch himself in action and evaluate his own behavior.

However, the school budget may not allow for expensive videotape equipment. In this case, the next best alternative--a roleplaying session without videotape--would have to be employed.)

E. How might an individualized instruction proponent react to the statement that the most practical, effective, and efficient medium for most types of learning is well-illustrated, step-by-step verbal instructions with feedback to the student?

(Individualized instruction proponents would probably react negatively to this statement. Self-study situations place the content and pace of the instruction almost entirely under the control of the individual student. Individualized instruction requires that each student have his own material, equipment, facilities, and individual tutoring when he needs it. Individualized instruction proponents, then, feel that this system is the most practical, effective, and efficient medium for most types of learning.) (6)

F. What are various techniques you have found useful for selecting media?

G. What are some illustrations of Fleck's criteria for selecting teaching methods?

(A teaching method should be used with confidence. For example, if an instructor is not familiar with the function of programmed instructional materials, this method should not be selected. Or if an instructor is not skilled in leading a roleplaying session, this method should not be selected.
A teaching method should implement a democratic philosophy. For example, a class based completely on the lecture method would not allow for student participation and therefore should not be the sole method selected.)

H. How specific should a lesson plan be? Should it be 30 pages of notes for a 2-hour lesson? Or 2 lines on a scrap of paper? Or something in between? Does it matter?

I. Do you have any problems or concerns regarding this module?

Part IV:

Student Self-Check

PART IV

STUDENT SELF-CHECK

Part A: Knowledge Assessment

GOAL 8.1

1. What are five general principles described by Tyler for the selection of learning experiences? (8.11)

2. What type of performance is primarily associated with this task: Recognize when a bed is ready for clean linens? (8.12)

   _____a. problem-solving
   _____b. recall
   _____c. speech
   _____d. discrimination
   _____e. manipulation

3. What type of performance is primarily associated with this task: Establish good rapport with customer? (8.12)

   _____a. manipulation
   _____b. speech
   _____c. recall
   _____d. discrimination
   _____e. problem-solving

4. If you wanted students to learn how to operate an eight-inch radial arm saw, what would be the most appropriate teaching method? (8.13)

   _____a. reading assignments
   _____b. field interviews
   _____c. group discussion
   _____d. practice and drill

5. If several instructional strategies are appropriate for accomplishing a specific objective, what criteria should you apply in selecting the one strategy to use? (8.14)

6. By what criteria would you decide whether or not to buy a commercially prepared sound filmstrip? (8.15)

GOAL 8.2

7. What are three major criteria for effective organization of instruction as identfied by Tyler? (8.21)

8. If the subject matter of instruction requires that units be presented in a certain order, what type of sequencing does this represent? (8.22)

   _____a. interest sequencing

   _____b. skill sequencing

   _____c. total job practice

   _____d. logical sequencing

   _____e. general to specific sequencing

9. What is the purpose of a lesson plan? (8.23)

Part B: Performance Assessment

The purpose of this part of the test is to assess your ability to perform some of the actual steps involved in the development of instructional materials. You should complete it outside of class and use any reference materials that may be helpful. Be sure to have the materials you developed for the Performance Assessment portion of the Module 7 Self-Check. You will now have a chance to build on the materials you completed there.

This test consists of completing each of the following items in order. As you finish each item, check it off and continue to the next. If you find any of the forms suggested in the Study Guide helpful in

completing these steps, use them. Otherwise, you may use your own particular forms, as long as you complete each step below as indicated.

_____1. Develop and sequence a listing of instructional units for a course to provide instruction for the occupation you selected in the Module 7 Performance Assessment.

_____2. For the one task you selected and detailed in Module 7, identify the type of performance primarily associated with each step involved. (8.12)

_____3. For the tasks you identified for school instruction in Module 7, select a sequencing strategy and put these tasks into a preliminary sequence. (8.14)

_____4. Develop a lesson plan for <u>two</u> of the instructional units you listed in Item 1. One unit should be primarily in the cognitive or affective domain and the other in the psychomotor domain. Be sure that the lesson plan reflects the unit objective, the specific content, the instructional strategy (teaching methods and media devices), student activities, and approximate time for completing each activity. The lesson plan should be a guide to the way students and instructor will spend their day. (8.23)

Part V:

Appendices

PART V

APPENDICES

Appendix A:

Possible Study Activity Responses

GOAL 8.1

1a. 1. For a given objective to be attained, a student must have experiences that give him an opportunity to practice the kind of behavior implied by the objective. Learning experiences must be set up that give the student a chance to do what the objective expects him to do as a result of instruction.

2. Learning experiences must be such that the student obtains satisfaction from carrying on the kind of behavior implied by the objectives. The student must be able to experience success by performing what the objectives require. Also, learning experiences must be selected with students' interests and needs in mind.

3. The behavior desired of students during learning experiences must be within the range of possibility for the students involved. Learning experiences should not require behavior of the students that they are not able to perform because they have not reached an appropriate stage of development.

4. Many particular learning experiences can be used to attain the same objectives. Instruction need not be limited to a prescribed set of learning experiences in order to assure that the desired objectives are attained.

5. A well-planned set of learning experiences will be made up of experiences that are useful in attaining several objectives at the same time.

1b. (The following are possible examples that illustrate Tyler's principles for selecting learning experiences. You may have thought of any number of other examples.)

1. If an objective requires students to be able to lubricate an automobile, the learning experiences must allow students to practice lubricating an automobile.

2. If an objective requires students to be able to interview a patient and admit him to a hospital, the learning experiences should allow students to experience success in performing the behavior required. Successful completion of an activity is satisfying.

3. If a learning experience requires students to repair a malfunctioning carburetor and students have not yet learned the basic parts of an automobile, the learning experience fails in its purpose.

4. If an objective requires students to identify the various nutrients needed by plants, a variety of learning experiences--lecture, audio-visual presentation, programmed instruction, reading assignments, etc.--could help students achieve this objective.

5. If an objective requires students to demonstrate proper safety procedures when working with power tools, the learning experiences that allow students to demonstrate such procedures will also help develop certain attitudes regarding the importance of practicing safety procedures.

2. a. b
   b. e
   c. a
   d. d
   e. c
   f. c
   g. a
   h. b

3. (The specific response to this activity depends on the particular occupation you selected. Check with your instructor.)

4. a. When one knows what needs to be accomplished, then identifying the type of performance to be developed is a first step in choosing an instructional strategy.

   b. (The specific response to this activity depends on your personal preference.)

5. a. b
   b. c
   c. a
   d. d

6. (The specific response to this activity depends on the particular occupation you selected. Check with your instructor. Three criteria you should have considered when selecting instructional strategies are:

   a. Choose the strategy that most closely approximates the performance conditions called for by the objective.

   b. Choose the strategy that causes the student to perform in a manner most closely approximating the performance called for on the job.

   c. Choose the strategy that will allow the student to make the largest number of relevant responses per unit time.)

7. (The specific response to this activity depends on the particular instructional strategies you selected.)

8. (The specific response to this activity depends on the particular occupation you selected and the objectives you developed for specific tasks of this occupation.)

9. (The specific response to this activity depends on the particular instructional media you selected to evaluate. You should have used the Media Evaluation Form as a basis for determining the quality of the material you selected.)

GOAL 8.2

1a. Tyler's three major criteria for the effective organization of instruction are:

   1. continuity--Continuity refers to the vertical reiteration of major instructional elements. For example, if an objective in trades and industry is to develop a positive safety attitude, it is important that this concept be dealt with again and again in various parts of the trades and industry course.

   2. sequence--Sequence is related to continuity but goes beyond it. Sequence emphasizes the importance of having each successive experience build upon the preceding one but to go more broadly and deeply into the matters involved. For example, if an objective in trades and industry is to develop a positive safety attitude, it is important that this concept be dealt with again and again in various parts of the trades and industry course, but at a higher level of treatment with each successive learning experience.

3. integration--Integration refers to the horizontal relationship of learning experiences. The organization of these experiences should be such that they increasingly help the student to get a unified view and to unify his behavior in relation to the elements dealt with. For example, in developing a positive safety attitude for a trades and industry course, it is important to consider ways in which this attitude can be effectively utilized in other courses and other fields. It should not be developed simply as an isolated behavior to be used in a single course, but should increasingly become part of the total capacities of the student and used in the varied situations of his daily life.

b. Common principles of organizing instruction as identified by Tyler include:
   a. chronological organization;
   b. increasing breadth of application;
   c. increasing range of activities included;
   d. use of description followed by analysis;
   e. development of specific illustrations followed by broader and broader principles to explain these illustrations; and
   f. building an increasingly unified world picture from specific parts which are built into increasingly larger wholes.

c. (The specific response to this activity depends on the particular course in which you are studying this module.)

d. (The specific response to this activity depends on the particular courses in which you are currently enrolled.)

2. a. e
   b. a
   c. d
   d. b

3. (The specific response to this activity depends on the particular occupation you selected. Check with your instructor. In developing a lesson plan, you whould have followed the seven basic steps described by Mager and Beach:
   a. outline the learning units;
   b. identify the type of performance involved;
   c. identify appropriate content;
   d. rough sequence the units;
   e. select instructional procedures and materials;
   f. final sequence;
   g. complete lesson plan details.)

Appendix B:

Possible Self-Check Responses

Part A: Knowledge Assessment

GOAL 8.1

1. What are five general principles described by Tyler for the selection of learning experiences? (8.11)

   (1) For a given objective to be attained, a student must have learning experiences that give him an opportunity to practice the kind of behavior implied by the objective.

   (2) The learning experiences must be such that the student obtains satisfaction from carrying on the kind of behavior implied by the objectives.

   (3) The learning experiences should be appropriate to the student's present attainments and predispositions. The student reactions desired in the experience should be within the range of possibility for the students involved.

   (4) Many particular learning experiences can be used to attain the same objectives.

   (5) The same learning experience can provide for the attainment of several objectives.

2. What type of performance is primarily associated with this task: Recognize when a bed is ready for clean linens? (8.12)

   ____a. problem-solving

   ____b. recall

   ____c. speech

   _X_ d. discrimination

   ____e. manipulation

3. What type of performance is primarily associated with this task: Establish good rapport with customer? (8.12)

_____a. manipulation

__X__b. speech

_____c. recall

_____d. discrimination

_____d. problem-solving

4. If you wanted students to learn how to operate an eight-inch radial arm saw, what would be the most appropriate teaching method? (8.13)

_____a. reading assignments

_____b. field interviews

_____c. group discussion

__X__d. practice and drill

5. If several instructional strategies are appropriate for accomplishing a specific objective, what criteria should you apply in selecting the one strategy to use? (8.14)

The criteria of practicality and availability are probably the best ones to apply when making a final selection of instructional strategy.

6. By what criteria would you decide whether or not to buy a commercially prepared sound filmstrip? (8.15)

Photographic quality: picture quality, photographic technique.
Sound quality: tonal quality, clarity, ability of narrator.
Content: vocabulary level, accuracy, timeliness of material, organization, continuity, level suitable for use, achievement of stated objective.

GOAL 8.2

7. What are three major criteria for effective organization of instruction as identified by Tyler? (8.21)

   (1) continuity

   (2) sequence

   (3) integration

8. If the subject matter of instruction requires that units be presented in a certain order, what type of sequencing does this represent? (8.22)

   _____a. interest sequencing

   _____b. skill sequencing

   _____c. total job practice

   __X__d. logical sequencing

   _____e. general to specific sequencing

9. What is the purpose of a lesson plan? (8.23)

   The purpose of a lesson plan is to guide instructor and student activities during a day. It specifies the activities the student may engage in to reach the objectives of instruction.

Part B: Performance Assessment

In scoring PART B, you should be primarily concerned with the techniques and processes used to develop materials. Personal judgment will be a major factor in scoring PART B. However, for the test items indicated below, assessment should consider these specific factors:

Item 1. The instructional units for which you are to develop and sequence a listing should represent the smallest amount of instruction that has purpose, interest, unity, and meaning within itself.

Item 2. The types of performances identified for each step of a task should be the ones primarily associated with the task step. That is, the task step may involve several types of performance, but it is the principal type of performance that is necessary to simplify the identification of course content.

You should have used five general categories for the identification of types of performance:

- discrimination
- problem-solving
- recall
- manipulation
- speech

Item 3. You may have selected any one of a number of sequencing strategies:

- from general to specific
- interest sequencing
- logical sequencing
- skill sequencing
- frequency sequencing
- total job practice
- other sequence of student's choosing

The important thing to note is that the sequencing does in fact represent a specific strategy with a specific purpose intended.

Item 4. The lesson plan should identify what both the instructor and the student will be doing during each phase of instruction. The teaching methods and media devices selected should be appropriate for the student activity, and should also be appropriate for accomplishing the instructional objectives. The methods and media selected should be practical, that is, available and economical.

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